TECHNOLOGY DEPT.

FLIGHT

MAGAZINE

JULY 1957

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BEECHCRAFT TRAVEL AIR

(See page 20)

GREEN MT. FOOT HILLS, VERMONT

Fast . . . smooth . . . nimble . . .

As hushed as a sleigh-ride over freshly fallen snow—that's a trip by Fairchild F-27.

Propjet power . . . more hushed than ever before . . . marks a new high in cabin quiet at all power settings. There's virtually no vibration.

Airline-proven twin Rolls Royce "Dart" propjets give the F-27 a wide, wide safety margin.

The pride of any fleet—corporate or airline—the Fairchild F-27 is economical to buy, to fly, to maintain.

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It's a fact that a corporate or private aircraft operator would have difficulty making a day's cross-country flight without encountering the Goodyear "Sign of Service."

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Reason? Reliability, parts availability, dependability.

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Box 1709, Wilmington, Delaware

STANDARD AIRCRAFT EQUIPMENT CO., INC.
P.O. Box 271, Mineola, Long Island, N. Y.

John H. Logsdon, president, (right) and Robert L. Donovan, vice-president and secretary, Interstate Airmotive, Inc., Lambert Field, St. Louis.

At Interstate Airmotive in St. Louis they found service the key to success

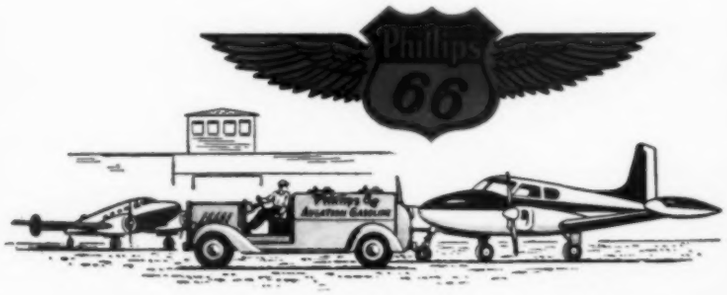
CAA-approved repair service is a feature of Interstate's operation. E. G. McEntee, line manager, at right, and F. H. Pogue, licensed A. & E. mechanic.

Phillips 66 Aviation Gasoline is used exclusively in servicing all types of aircraft.

After World War II, in which John Logsdon was an aviation cadet instructor and Robert Donovan served as a pilot in the 8th air force, these two young men purchased Interstate Airmotive. Logsdon recalls that, at the time, Interstate was a $50,000-a-year business. In 1956, Interstate grossed in excess of $1 million.

"Service, we believe, is the key to this increase in business," Mr. Logsdon said. Interstate was one of the first to offer courtesy cars to incoming pilots; and the facilities include a pilots' lounge. Interstate offers 24-hour complete line service for both commercial and private aircraft. It has one of the country's most complete radio repair shops. It offers CAA-approved repairs, charter service and hangar storage.

Interstate sells Phillips *66* Aviation Gasoline exclusively. "We felt that as a part of better service, we must supply a dependable fuel," Mr. Donovan said. "That's why we decided to service our customers' aircraft with Phillips *66* Aviation Gasoline."



AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report

Significant Trends and News

PIPER 4-PL., 180-HP. COMANCHE was CAA certificated on June 20, 13 months after the first Comanche flew on May 24, 1956. First production model will fly in August and first 8 will be retained by Piper for accelerated service tests and demonstrations, with deliveries to distributors in the fall. Target price is $13,500 for the all-metal, low-wing Comanche.

PRESSURIZED, 12-PL. PROPJET BUSINESS TRANSPORT with 370-mph. maximum cruising speed at 25,000 ft. has been announced by Grumman Aircraft as its re-entry into the commercial airplane market it left in 1950. It will be powered by two Rolls-Royce Darts, will gross 31,000 lbs. with 78-ft. span, 64-ft. length, have 2,200-mi. range with IFR reserves and will operate from runways under 4,000 ft. long. First airplane of the new model, designated as the Grumman 159, will be off the production line in May, 1958. A high-density version of the 12-place executive craft will seat 20 passengers.

JET UTILITY TRANSPORT BY LOCKHEED, 500-mph. 10-place design aimed at military and business plane orders, may fly by October. It will be offered in twin-jet and 4-jet versions, its engines mounted Caravelle-fashion behind the wing and cabin.

BELL'S 4-PL. 47J HELICOPTER has been certificated at a new 2,800-lb. gross weight, up from 2,565 lbs., increasing its useful load from 950 to 1,182 lbs. The J is powered by a Lycoming VO-435 engine derated to 240 hp. for take-off. . . . **MULTI-MILLION-DOLLAR ARMY ORDER FOR TURBINE-POWERED BELL H-40 HELICOPTERS** has been issued. Number involved was not revealed. The H-40 seats 6 and is powered by an 825-hp. Lycoming shaft turbine.

FIVE FAIRCHILD F-27 FRIENDSHIP PROPJET AIRLINERS have been ordered by Avensa Airlines for its Miami-Jamaica-Caracas service. . . . **MORE POWERFUL ROLLS-ROYCE DARTS** will be available for the Fairchild F-27 in January, 1959, and Wien Alaskan Airlines will be the first purchaser of F-27's equipped with the new RDa 7 Darts, rated at 1,800 shp. for take-off. They boost cruising speed to 300 mph., rate of climb to 1,770 rpm. from 1,480 fpm., and single-engine service ceiling to 16,000 ft. . . . **FAIRCHILD HAS RETURNED $4,767,683 TO THE AIR FORCE** from savings it effected in fixed-price contract tooling and production of the C-123 transport.

FIVE PIPER APACHE TWINS have been delivered to the Argentine Army. . . . **A NEW BEECH SUPER 18 EXECUTIVE TRANSPORT** delivered to Rio de Janeiro will be used by Brazilian President Juscelino Kubitscheck de Oliveira.

THE TRANSLAND AG-2 CROP PLANE is being evaluated with a 600-hp. P & W R-1340 engine.

BRITANNIA TURBOPROP AIRLINERS have been ordered by Aeronaves de Mexico and Compania Cubana de Aviacion, each ordering two of the large 400-mph. British craft. They are powered by four Bristol Proteus turboprop engines rated at 4,120 shp. each.

FOUR LOCKHEED SUPER-H CONSTELLATIONS have been ordered by the Brazilian airline, Real-Aerovias.

KARNISH INSTRUMENT SALES AND SERVICE of Lock Haven, Pa., has purchased the Instrument Division

NEW 5-NI-I LEAR indicator for OmniMeter and Vortran features naturally-oriented presentations of course selections, to-from, left-right, reciprocal course and direct-reading heading change indication. As OmniMeter, it is applicable to any Arinc omni system. As Vortran, with integral transistorized omni converter, it can be applied to any VHF receiver covering omni frequencies.

FLIGHT MAGAZINE

JULY, 1957 VOL. 46, No. 7

THIS MONTH'S COVER features the first flight photo of Beech Aircraft's production model Travel Air, the new 4-place, 200-mph. small twin which was CAA certified last month. Price has yet to be announced but will be in $45,000-$50,000 bracket. Engines are 180-hp. 4-cylinder Lycomings. For details, see page 20.

(Beech Photo by Jim Yarnell.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, *Consultant;* P. O. BOX 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TAylor 3-6191.

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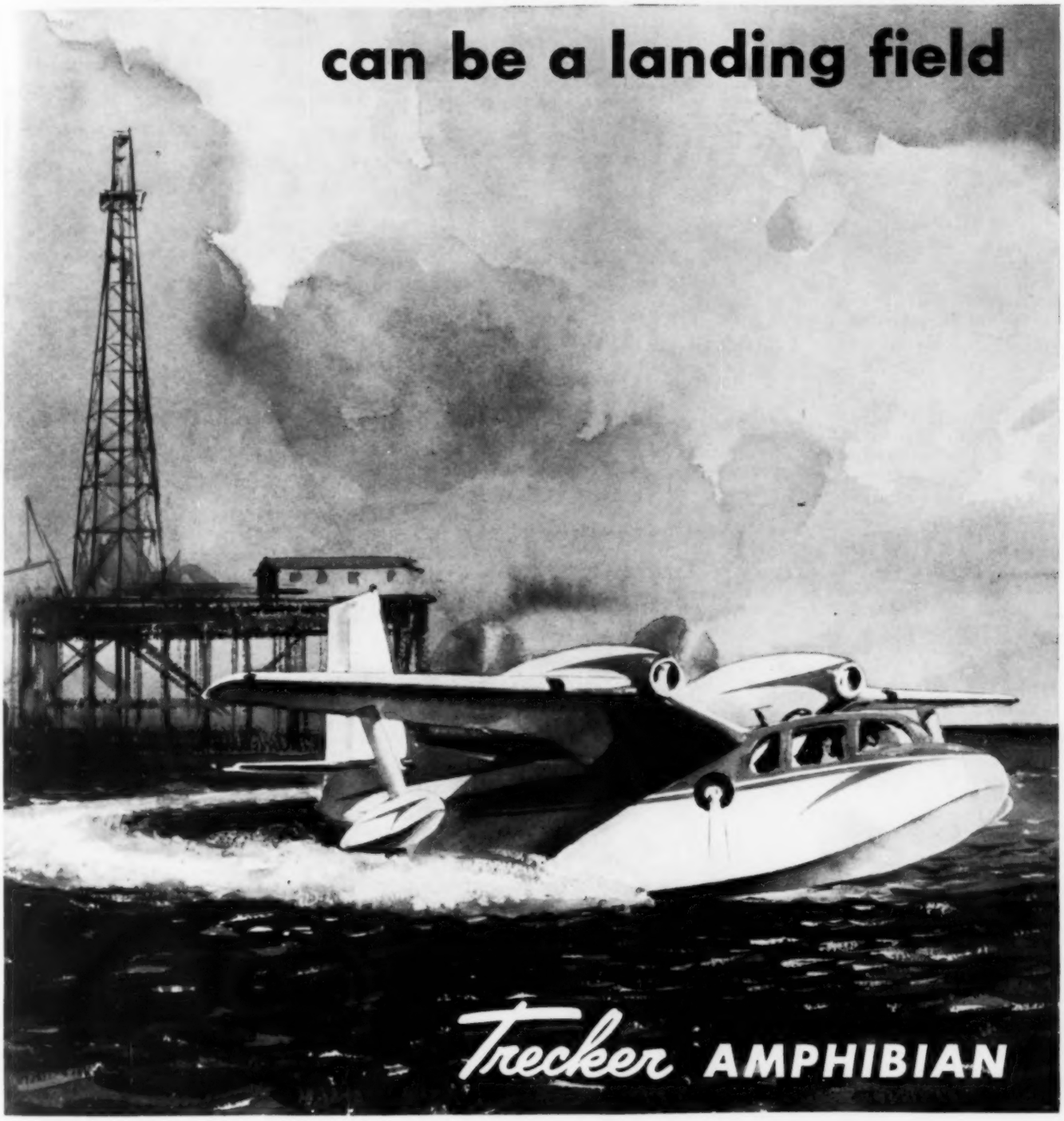
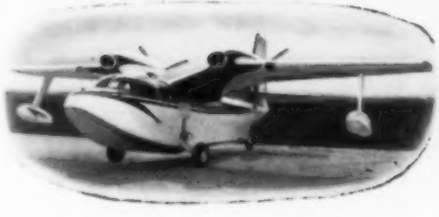
Any Airport, Lake, or River...

can be a landing field





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CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD ®

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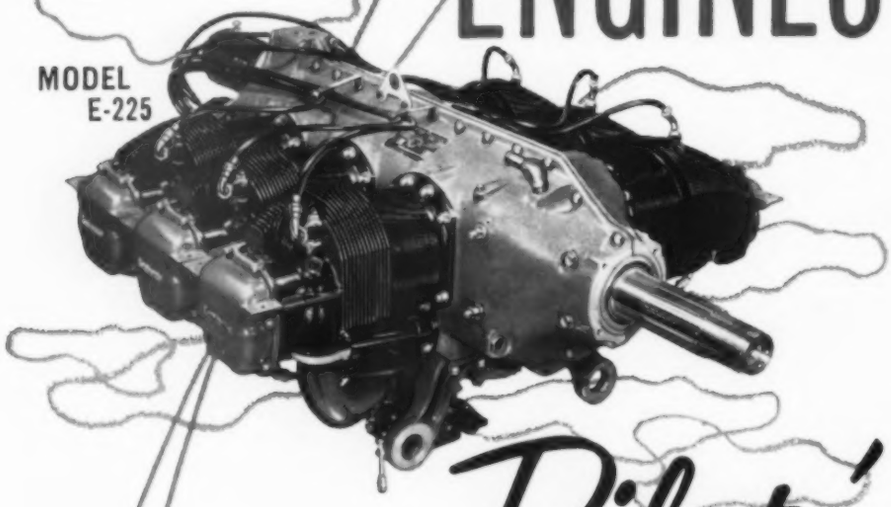

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. . . because they're Continental-engineered for safety, dependability, long-life—and backed by established parts and service facilities the world over.

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C90-12F	90	2625	4	186	80
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E-225	225	2650	6	363	80
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O-470-M	240	2600	6	450	91/96
O-470-G	240	2600	6	466	91/96
O-470-H	240	2600	6	510	91/96
FSO-526-A (Helicopter)	270	3000	6	568	91/96
GSO-526-A	320	3000	6	560	91/96

CONTINENTAL'S ENGINE REMANUFACTURING SERVICE gives you a new factory-remanufactured engine—back to zero hours and with factory new engine guarantee. Ask your Continental Motors service station about this plan.

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

MUSKEGON • MICHIGAN

of the Lackner Co. of Cincinnati, and production facilities have been moved to Lock Haven where Karnish is now turning out rate of climb, airspeed and cabin air pressure indicators. Karnish started in the aircraft instrument overhaul business in 1947 and recently added 5,000 sq. ft. of manufacturing space to its plant.

AN AIRCRAFT COLLISION-AVOIDANCE RESEARCH PROGRAM has been started by Bendix Radio on a contract from the Air Force.

A NEW WORLD RECORD ALTITUDE OF 30,330 FT. has been reached by an Aero Commander 680 Super piloted by Miss Jerrie Cobb at Oklahoma City. She took off at a 5,558-lb. gross load in a standard airplane to set the record for aircraft in the 3,858-6,613-lb. category.

FIRST SAILPLANES FOR THE AIR FORCE ACADEMY have been delivered to the Air Force by Schweizer Aircraft of Elmira, N. Y. They were a 2-22A trainer and a 1-26B high-performance sailplane. Soaring will become a scheduled part of the curriculum this summer.

NEW OFFICERS ELECTED BY THE FLYING PHYSICIANS ASSOCIATION at its New York meeting last month are S. D. Sullenberger, Dandridger, Tenn., president, and the following vice presidents — C. M. Starr, North Hollywood, Calif.; Gordon Jones, Olympia, Wash.; C. H. Loomis, Richmond, Ind.; J. J. Quinlan, Brantford, Ontario, and J. Y. Bradfield, Dallas. The banquet was attended by 125 with Gill Robb Wilson as guest of honor. Capt. W. R. Knowell, Aviation Crash Research of Cornell University, gave a talk on lightplane safety.

Friends and associates of **SHORTY FULTON,** who has served as manager of the Akron (Ohio) Municipal Airport for 30 years, gave a testimonial dinner in his honor June 26. Few if any airport managers have served that long without interruption.

Airmen's Calendar

July 13-19—5th Annual Jaycee Air Cruise, Philadelphia to Las Vegas.

July 30-Aug. 2—2nd Annual National Flying Club Convention, Denver, Colo.

July 31-Aug. 4—11th Air Force Association Convention, Sheraton-Park and Shoreham Hotels, Washington, D. C.

Aug. 10-11—Midget Airplane Races, Oshkosh, Wisc.

Aug. 20-22—Bendix-Scintilla International Ignition Conference, Sidney, New York.

Aug. 30-Sept. 1—Kentucky Jaycee Air Tour. For information, write Frank Savage, Kentucky Jaycees, Fincastle Building, Louisville.

Aug. 31-Sept. 1—Midget Airplane Races, Ft. Wayne, Ind.

AERO COMMANDER OUTSOLD ITS CLOSEST COMPETITOR BY MORE THAN

58%

*IN THE FIRST FIVE MONTHS OF 1957**

Executive transports are bought for one reason only—because they deliver the superior performance demanded by business and industry.

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—LOCKHEED T-33
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American businessmen more and more are using the "face to face" approach in the conduct of their activities. With the 300 mile per hour plus, 2000 mile range Super Ventura, the businessman can conduct a face to face life being at home with the family at night after calling on clients all over the nation during the day.

Both Face to Face Business and Face to Face Life with the family is possible with the Howard Super Ventura — in operation or on order from 21 of the nation's leading businesses.

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SAC Silver Jubilee Newsreel

BY JACK PATTON

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SAC "MISSIONARIES" SET OUT TO PIONEER PARTS AND ACCESSORY SALES TO THE AIRLINES
DELTA
AMERICAN
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RESULT: CURRENT MULTI-MILLION DOLLAR SALES TO 12 AIRLINES
YOU NAME IT.. WE'VE GOT IT!
AJAX FLYING CO.
SUPPLIES AND NEW IDEAS ALSO FLOW TO FIXED BASE OPS, LARGE AND SMALL
FISHING'S GOOD TOO!
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DISTRIBUTION DIVISIONS HAVE OPENED IN KANSAS CITY AND DENVER

AC, Aeroquip Corp., A. P. Parts Co., Bendix Products Div., B. F. Goodrich, Canadian P & W A, Delco-Remy, Eclipse-Pioneer, Glidden Co., Gould Nat'l Batteries

Southwest Airmotive not only has pioneered many vital equipment-sales concepts, it also has done much to open the industry's eyes to a proud meaning and a new dignity in the word "distributor." The firm's role in worthy industry affairs is legendary, dating 'way back to such things as this SAC-sponsored WW II aeronautical tent-show.

Grimes Mfg. Co., Hamilton Standard, Lycoming, Montrose Div. (Bendix), New York Air Brake, Pacific Div. (Bendix), Packard Electric, Pesco

Set to move in the fall into its new home—the former City of Dallas airline terminal (immediate right)—SAC's distribution division is one of aviation's finest sales forces. VP Paul Kennedy, "head coach" of a fiercely loyal team, is shown in the inset photo presenting a service award to Bob Jackson, Midwest Division manager.

Pioneer Central Div. (Bendix), Pratt & Whitney Aircraft, Red Bank Div. (Bendix), Scintilla, Skinner Div. (Bendix), Utica Div. (Bendix), and Willard Batteries

1932 —A QUARTER CENTURY OF LEADERSHIP— 1957

Southwest Airmotive Co.
LOVE FIELD DALLAS
DIVISIONS: KANSAS CITY, KANSAS / DENVER, COLORADO

Just among ourselves

Wisdom at the State Level

THE State of Massachusetts is considering legislation which would exempt private airports used by the public from property taxation. The question of the validity of the bill was submitted to the Supreme Judicial Court by the Massachusetts Senate. Last month the Court held that such airports are public service corporations and may receive favored tax treatment. The stated purpose of the law is to encourage development of airports by private capital.

We doubt if this opinion will set off a wave of private airport construction. But if the legislation goes through in Massachusetts the net effect of the action will be of tremendous importance to airport development throughout the nation. Alert state aviation and civic officials elsewhere will pick up the campaign and attempt to get similar favorable tax advantages through their own legislative mills in order to encourage the building of more airports with private funds.

The attrition rate of our nation's smaller airports owned by private enterprise continues apace with no let-up in sight. Housing and industrial real estate developments keep chopping into private airport numbers not only because of increased land values but also because of the taxation problem. It has been clearly demonstrated that private airports can be money making propositions; but unless the landing area is owned or "dedicated" to local or state governments there is absolutely no guarantee that they will be permanent like their municipally owned counterparts which are used for identical purposes by identical public travelers, yet go tax free.

The opinion of the Massachusetts Supreme Judicial Court holds potent long-range implications for a part of the solution to our critical airport problem, especially in the realm of general aviation facilities.

More on SBA Hangar Loans

THIS publication's interest in the matter of correcting the hangar shortage by fair means or foul, and more especially our recent complaints regarding the Small Business Administration's policy regarding loans to operators for hangar construction, have created considerable interest and more than usual response from readers.

Our old friend L. L. Schroeder, who for many years headed the Minnesota Department of Aeronautics and now is engaged in the private practice of law, writes with considerable knowledge on the subject as follows:

"The SBA loans have inherent deficiencies, particularly for buildings, and I would not urge any operator to seek an SBA loan for that purpose, first because the interest rate is high, and second, because the maximum term of the loan is ten years, which means that an SBA loan used for building purposes would have to be refinanced ultimately in any event.

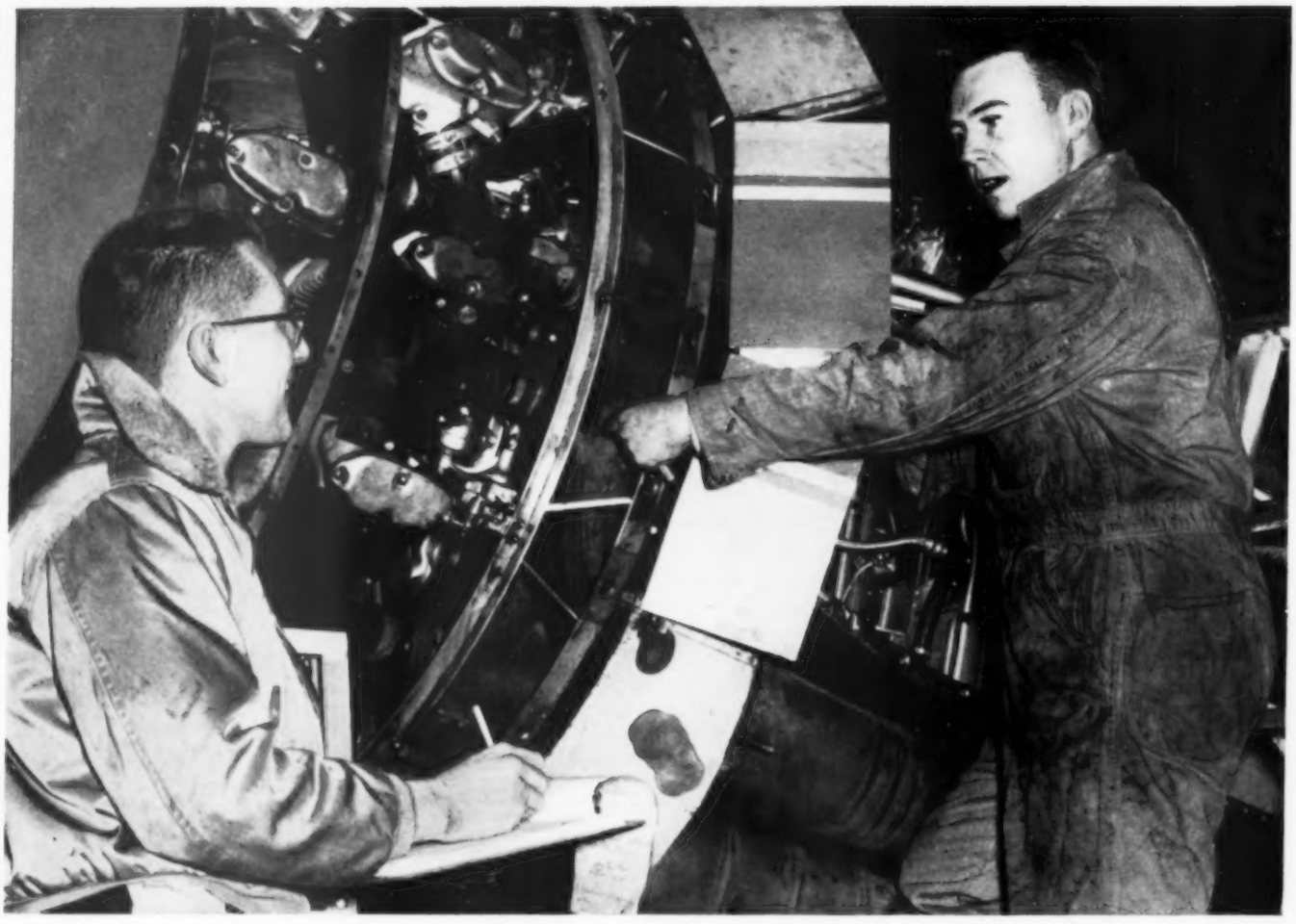
"The three major objections which the commercial money markets have had to loans for airport structures have been (1) the short term of the lease usually granted by municipal airport owners, (2) reluctance to loan in any event if the structure was to stand on leased ground and be a chattel instead of being protected by the fee, and (3) the single purpose nature of the structure. These three major difficulties have a progeny of secondary difficulties in the nature of the open-end type of lease, which has been sold by many airport consultants to municipalities, requirements contained in the sponsors assurance agreement under the Federal Airport Act, and limitations contained in the lease, which in effect require that if the structure is to be used as a 'barn' it can only be used as a 'cow barn'.

"Relief for the industry segments which now desperately require expanded and modern facilities on airport properties owned by public bodies will not come from Federal loans in my estimation. Even the SBA loan, which I recently negotiated for a client, was dependent upon concurrence and acceptance by a local participating bank for the purpose of administering the loan. After the local bank, which entered upon the deal with great reluctance, experienced the red tape involved, it said, 'Never again!' The officers made it clear that if the collateral had been acceptable in the first instance, they would have been willing to loan without the assistance of SBA.

"The approach to the commercial money markets then lies in correcting the three major difficulties and their progeny. This can be done. I was successful in amending our Minnesota statutes so as to permit a ninety-nine year lease of municipal airport properties for the purpose of constructing hangars, shops, motels, hotels, restaurants and any and all other types of structures which in the opinion of the municipality might be of service, or useful to, the operation of aircraft and the persons and things carried in aircraft.

"The next two steps are more difficult because they must be accomplished on a national scale, namely, a modification of the lease requirements contained in the sponsor's assurance agreement under the Federal Airport Act, and last of all, the adoption of a standard form of commercial lease by municipalities free of the typical open-end provisions and the conditions which virtually make the municipal owner a partner in the business enterprise."

Like Mr. Schroeder, we're inclined to believe that SBA loans are just about in the "last resort" category and that further pounding on the SBA doors is a useless pastime. It is going to take a lot of doing, however, to remove the stumbling blocks to the commercial money markets. The lawyers, the airport management profession and the airplane user and operators will have to work together on that one.



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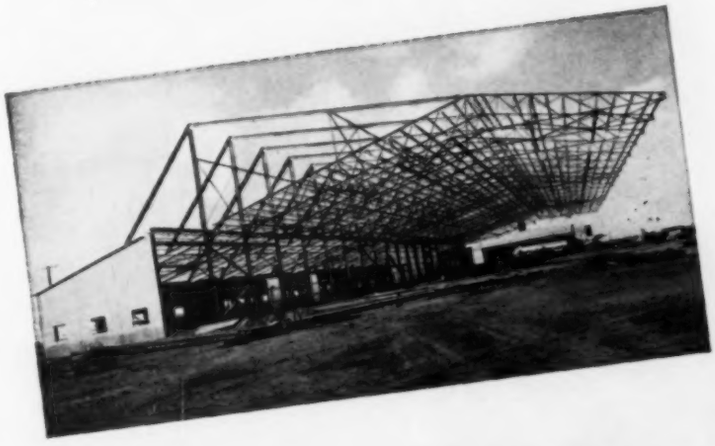
...the world's finest aviation products

A brand new concept in

modern day hangars...

ERWIN-NEWMAN SUSPENDED CANTILEVER HANGARS

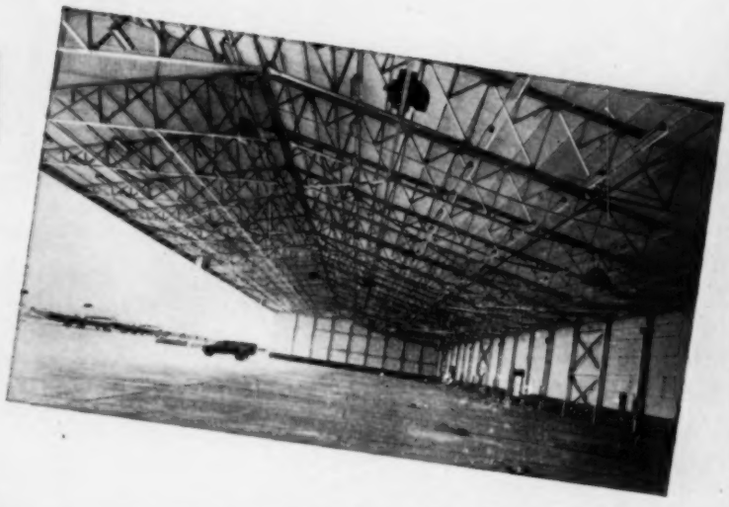
Most revolutionary development in the last fifty years



Cantilever type construction means that no columns of any nature interrupt the clear span space. EVERY square foot of hangar space is a square foot of usable space. The support member which connects the top ridge of the cantilever to the top of the inner column is designed to act either in tension or compression and will withstand the exact load forces of any locality.

ANY HEIGHT • ANY LENGTH • ANY DEPTH

Each hangar is specifically designed for the snow and roof loads of the area in which it is erected. The space at the rear is conveniently used for workshops, parts and offices.



Night view of TEMCO AIRCRAFT CORP. hangar at Greenville, Texas. The clear span area measures 120 feet deep by 576 feet long by 30 feet high. Vertical clearance is 45 feet inside the tail housings.

TYPICAL QUOTES FROM SATISFIED USERS INCLUDE:

Mr. E. F. Buehring, Plant Manager, TEMCO AIRCRAFT CORP., says, "The cantilever type hangar constructed by your company has proved to be highly satisfactory for our aircraft overhaul and modification program."

Mr. C. F. Zimmerman, Supt. Aviation Operations, CONTINENTAL OIL CO., remarked, "It is our opinion that this hangar constructed by your firm has measured up to our expectations and fulfills all of our requirements."

Write us for free booklet or any other information you desire

THE ERWIN-NEWMAN CO.

Designers and Constructors

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NAVY
59

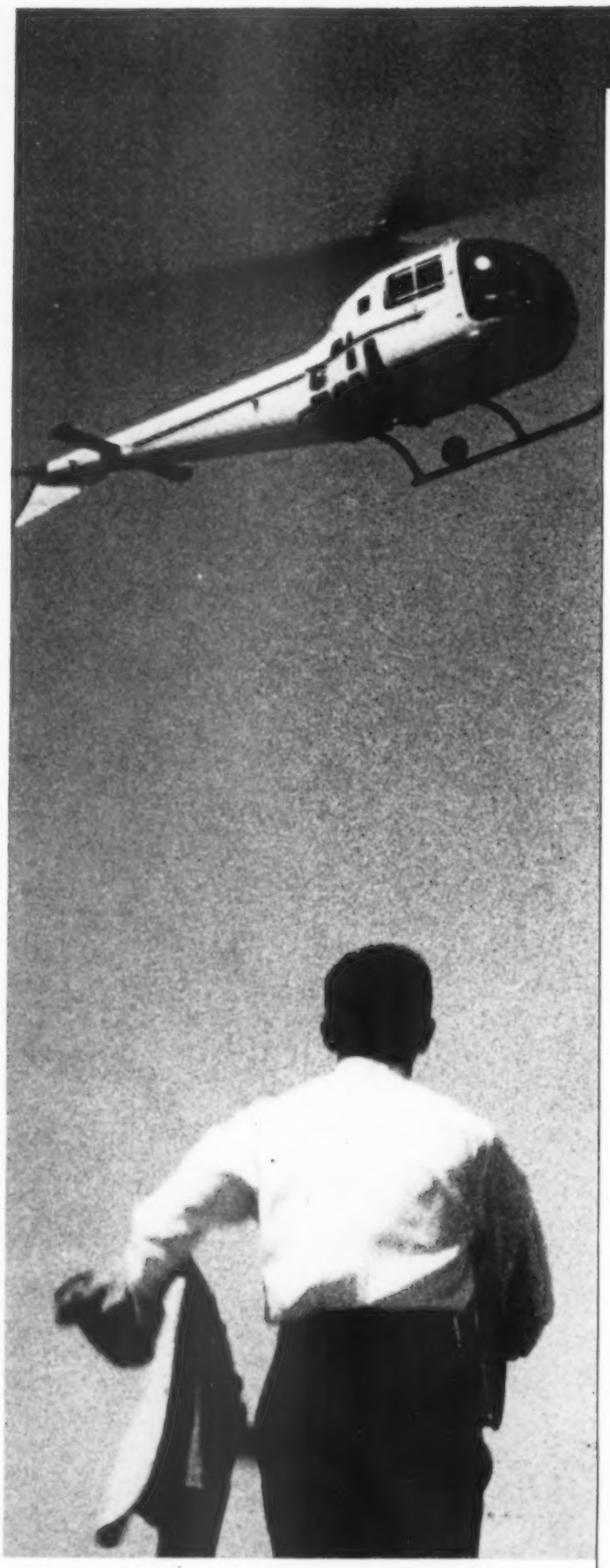
T2V-1 SeaStars will soon go into service with the Naval Air Training Command

9 OUT OF 10 U. S. MILITARY JET PILOTS WERE TRAINED IN LOCKHEED JETS. THE NAVY'S NEW T2V-1 "SEASTAR", BUILT BY LOCKHEED'S CALIFORNIA DIVISION, IS THE FIRST U. S. PRODUCTION PLANE WITH HIGH-SAFETY BOUNDARY LAYER CONTROL.

— — — — —

LOCKHEED *means leadership*

BALLISTIC MISSILE RESEARCH & DEVELOPMENT • ROCKETRY • WEAPON SYSTEMS MANAGEMENT • NUCLEAR-POWERED FLIGHT • ADVANCED ELECTRONICS • ANTI-SUBMARINE PATROL AIRCRAFT • LONG RANGE EARLY-WARNING RADAR CONSTELLATIONS • JET FIGHTERS • JET TRAINERS • COMMERCIAL & MILITARY PROPJETS • LUXURY LINERS



You can afford to use a helicopter

Profit is that elusive stuff left over after costs have been coaxed down. The Bell helicopter — with eleven years' business experience — starts saving you money almost from the moment you put it to work. In manufacturing, in construction, in utilities and minerals, the Bell cuts outdoor man-hour costs, puts key men anywhere, anytime, regardless of climate or terrain; it covers satellite plants and work-sites, and serves rich and hard-to-reach sales markets. In emergencies (community-wide or business), the Bell may be indispensable as the air it commands.

These are not pipe dreams; they're hard, documented facts — we have them in our files by the hundreds. The executive determined to "make it" for his company despite rising costs and stand-still pricing, should find out how the Bell can help him do it. Excellent, nearby CHARTER HELICOPTER SERVICE or Bell's convenient LEASE-PURCHASE PLAN may be your most economical way to learn *quickly* what the Bell can do for you. Meanwhile, write us today and we'll send full information about costs and models, together with performance reports from Bell users.
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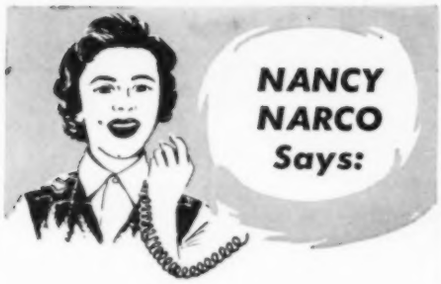


HAD A SERIOUS TALK with a bunch of senior-type control tower operators the other day. It started when I asked them what was the greatest single problem in their work. To my surprise—it was the little matter of receiver tuning.

THE MAN IN THE TOWER has a lot of facilities at his disposal, but they're not worth a thing when the little man who calls him for landing instructions doesn't have his receiver tuned to the right frequency. Usually, this guy calls and calls; he may get sore that the tower is apparently ignoring him. He may suspect that his transmitter isn't putting out, so he starts blowing and whistling and banging at his defenseless little mike. "Why," my tower friends ask, "don't they just tune their receivers to our frequency?"

LOTS OF REASONS WHY—all pretty silly. Out-of-date charts may show the wrong tower frequency—or, more likely, it's a case of improper tuning. So many people fail to allow for small tuning errors which are unavoidable in tunable receivers. Best thing is to tune to the tower while he's talking to someone else a few minutes before you have to call. If not, "rock" your tuning dial immediately after calling the tower until you hear him replying.

INCIDENTALLY, it would sure help if the tower boys would say their identification more frequently. Often you tune what you think is the tower you want only to find it's some other tower on an adjacent frequency.

OF COURSE, you people with crystal-controlled receivers have no problem. And the "whistle stop" introduced by Narco for positive crystal-calibrated tuning has made life simpler for thousands of Simplexer and Omnigator Mark II owners.

SOME DAY NARCO will catch up with its back orders on the new Omnigator Mark II, with "whistle stop" and all. Then you'll have yours, and you won't have to worry.

Regards,

Nancy

NARCO • Fort Washington, Pa.

Need more frequencies?

. . . FOR BETTER TOWER, EN ROUTE AND DIRECT CENTER COMMUNICATIONS

Add the narco SIMPLEXER

27 CHANNEL VHF TRANSCEIVER

The Narco 27-channel Simplexer is business aviation's most popular communications transceiver. With its broad-band transmitter (118 to 126.7 mc) the Simplexer accommodates 27 crystals covering every channel needed for normal IFR operations. "Whistle-stop" feature gives quick, crystal-calibrated tuning for simplex transmission with center, tower or ATCS. Compact size permits convenient installation. Thousands of Simplexers are in daily use. Just the answer for that extra communications unit you need while working VOR or ILS.

AND NOW! narco VTA-3

27 CHANNEL TRANSMITTER WITH "WHISTLE-STOP" TUNING FEATURE

Now, multiply transmitting channel capacity with little weight penalty and lowest cost with the new Narco VTA-3, 27-channel VHF transmitter. VTA-3 can be used with own power supply as independent unit or in conjunction with Narco Omnigator or Simplexer. Available in low-band version (118 to 123 mc) or high-band version (121.5 to 126.7 mc).

"Whistle-stop" feature provides positive, crystal-calibrated tuning of any VHF receiver in the airplane.

You'll enjoy the convenience of the extra 27 channels provided by either the Simplexer or VTA-3. Bring your communications up to date with one or both of these fine Narco units. See your Narco dealer or write for brochure.

narco

NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PENNSYLVANIA

Here's the first production model of the new 200-mph., 4-place Beech Travel Air, about 40 units of which may be delivered in 1957 with one-a-day output in 1958. Engines are 180-hp., 4-cylinder Lycomings. Price had not been finalized late in June, is expected to be in $45,000-$50,000 bracket.

—(Beech Photo.)

Beech Travel Air Ready to Go

By GEORGE E. HADDAWAY

WE had the fortunate opportunity to fly the long-awaited Beechcraft Model 95 Travel Air last month en route home from the Aviation Distributors and Manufacturers Association meeting in Colorado Springs, where we visited with Beech Commercial Sales Manager Leddy Greever. He happily announced the Travel Air had just received its approved-type and production certificates from the Civil Aeronautics Administration. We listened with awe at Greever's description of the plane and its performance. Sales managers, we thought, were always a bit on the optimistic side. Why not wrangle an invitation to the factory and see for ourselves?

That's exactly what we did. And it later turned out Salesman Greever was the most conservative of the Beech family about this new addition to a great line of high performance aircraft. General Manager Jack Gaty, Project Engineer Gomer Jones, Test Pilot Steve Tuttle and Beech Distributor Bob Northington of North Carolina, who was in our group, put Leddy in the shade when it came to enthusiasm and pride in the newly born design. Tuttle had flown Number 2 Travel Air more than 70 hours and Jack Gaty had gone with it to Fort Rucker, Alabama, for a demonstration flight to the Army. Gomer Jones had sweated it out ever since the design was conceived and Northington had one demo ride. After my ride I joined their ranks, leaving Greever at the post.

It's an honest 200-mph. airplane. We took off with full gross load — four people, 84 gallons of gas, full complement of radio and instruments. It is one of those rare flying machines that sounds good on paper and then surpasses every expectation after you get in it and give it a whirl. We broke ground sooner than expected, climbed out at 1,500 feet per minute pulling 27 inches. At 5,000 feet we indicated 180 mph. at 65 per cent of power, turning 2,400 rpm. and pulling 23 inches of manifold pressure with fuel consumption at only 16 gallons an hour! Listed with this article are the complete factory figures on this newest of the twins. Note that service ceiling at 4,000-lbs. gross on one engine is 6,200 feet. On our flight we maintained 8,000 feet with one prop feathered, indicated 106 mph., turning 2,450 on the right engine.

We did every kind of stall in and out of the books. Full power, power off, single-engine and secondary. Once out in the field we believe it will become known as about the most stable airplane in its category. It literally "talks" to you in the stall approach and has no tendency to roll and the aileron control in the stall is fantastic. With such inherent built-in safety as its stall characteristics the Travel Air promises to produce many competent twin-engine pilots out of the healthy crop of today's single-engine pilots.

We tried the emergency gear drop

Jack Gaty (wearing hat), Beech general manager, is shown with his commercial engineers and new CAA license for Travel Air. Left to right are Herb Rawdon, Gaty, Gomer Jones and Herman Barnett.

at about 175 indicated. The nose went up slightly, then pitched smoothly downward, then up again to original trim position.

Next to its outstanding flight characteristics and performance we were impressed with the quiet ride, even at full-throttle take-off. When questioning Gomer Jones on this we learned that it is actually three decibels quieter than the single-engine Bonanza, just about the ultimate in "hush" cabins.

The mighty little 4-cylinder Lycoming 0-360's, rated at 180 hp. for all operations, use a new-type engine mount that reduces vibration to the vanishing point. Augmentors for the exhaust have been abandoned without any cost in performance. Cowl flaps provide superb cooling. The radio compartment is in the nose. We had 120 pounds of airline-type radio equipment, plus the battery, in the same amount of space the Super 18 offers. Happy will be the radio mechanic who works on the Travel Air. He simply walks up to the access door, opens it and goes right to work with everything in front of him as if he were at his work bench.

When Jack Gaty launched the Travel Air project he told his men to leave no stone unturned to accomplish maximum performance at minimum cost and above all things, to get quietness and comfort into the design.

The Travel Air has already been static-tested to 6.6 g's, with tougher testing yet to come. The center section structure and the spars are beefed up to twice the strength of the single-engine Bonanza.

Thus the long-awaited Travel Air is ready to make a name for itself on the business plane market — its success assured by fullest possible development testing plus endowment with time-proved components from the Bonanza's cabin, the Mentor's basic wing, tail and landing gear, the Twin-Bonanza's wing leading edge and the Super 18's wing-tip plan. Thirty-five per cent of all parts will come from present tooling. In a word, the Travel Air is probably the finest Beechcraft ever built.

Price and delivery schedule remain to be announced. It was originally intended that the Travel Air, then called the Badger, would be priced

(Continued on page 55)

Beech Model 95 Travel Air

Factory Data
June 24, 1957

Price	**To Be Announced; $45,000-$50,000 Class**
No. Seats	**4**
Take-off Power, hp.-rpm.	**360-2,700**
Rated Power, hp.-rpm.	**360-2,700**
Gross Wt., lbs.	**4,000**
Empty Wt., lbs.	**2,580**
Useful Ld., lbs.	**1,420**
Av. Wt. for People, Baggage With Std. Fuel, lbs.	**916**
High Spd., mph.-alt.-ft.	**208-SL**
Cr. Spd., mph.-% hp.-alt.-ft.	**200-75%-7,500**
Cr. Spd., mph.-% hp.-alt.-ft.	**191-65%-11,500**
Stall spd., pow. off, 33-deg. flaps, gear down, mph.	**68**
Minimum SE Control Spd., mph.	**84**
Best SE Climb Spd., mph.	**100**
Rate of Climb, fpm.	**1,350**
SE Rate of Climb, fpm.	**250**
Service Ceiling, ft.	**19,000**
Absolute Ceiling, ft.	**20,900**
SE Service Ceiling, ft.	**6,200**
Absolute SE Ceiling, ft.	**8,000**
Std. Fuel Cap., gals.	**84**
Optional Fuel Cap., total gals.	**110**
Engine Oil Cap., total qts.	**16**
Max. Cruising Range @ 164 mph., miles-gals.	**1,102-84**
Max. Cruising Range @ 164 mph., miles-gals.	**1,400-110**
Endurance, hrs.	**8.73**
Take-off Dist., no wind, ft.	**850**
Take-off Dist. over 50 ft., no wind, ft.	**1,050**
Landing Dist., no wind, ft.	**979**
Landing Dist. from 50 ft. no wind, ft.	**1,449**
These figures are for maximum performance.	
Baggage, rear, lbs.	**270**
Baggage, nose, lbs.	**270**
Span, ft.-ins.	**37-10**
Length, ft.-ins.	**25-4**
Height, ft.-ins.	**9-6**
Wing Area, sq. ft.	**193.8**
Wing Loading, lbs. sq. ft.	**21.6**
Power Loading, lbs. hp.	**11.1**
Cabin Dimensions, length-width-height, ins.	**83-42-50**
Passenger Door Size, ins.	**36 by 37**
Baggage Door Size, ins.	**24 by 22**

NOTE: All performance is for gross weight at sea level unless specified. ENGINES: Two 4-cylinder 0-360-A1A Lycomings, rated at 180 hp. at 2,700 rpm. each for all operations. PROPELLERS: 72-in. hydraulically-controlled, continuously-variable-pitch, full-feathering Hartzells, with Woodard hydraulic governors. ENGINE EQUIPMENT: 2 starters, 2 generators, 2 voltage regulators, 2 engine primers, 2 fuel booster pumps, 2 carburetor air filters, 2 mufflers and carburetor heaters (stainless steel), 2 exhaust manifolds (stainless steel), 2 vacuum pumps. LANDING GEAR: Swiveling, steerable nose wheel with shimmy dampener. Beech air-oil struts on all wheels designed to withstand vertical descent landing component of over 600 fpm. Main tires 6.50-ins. by 8-ins., nose wheel tire 5.00 ins. by 5-in. Goodyear wheels with single-disc hydraulic brakes. ELECTRICAL EQUIPMENT: 24-volt, 17-amp.-hr. battery; electric flaps and gear; electric cowl flaps; dual generators; position lights and landing lights. STANDARD FLIGHT INSTRUMENTS: Airspeed, electric turn and bank, sweep-second 7-jewel clock with elapsed time recorder, outside air temperature, sensitive altimeter, rate of climb, compass, heated pitot tube, gyro horizon, directional gyro. STANDARD ENGINE INSTRUMENTS: Tachometer, manifold pressure, engine gauge unit with fuel pressure, oil temperature and oil pressure, fuel quantity, ammeter, cylinder head temperature. LIGHTS: 2 landing lights in wings, position and tail lights, cabin dome and instrument lights, landing gear and flap position lights, (rotating beacon optional). CABIN EQUIPMENT: Ultra-violet-proof windshields and windows, tinted cabin side windows, full upholstery including wall-to-wall carpet, cabin loudspeaker, map compartment and glove compartment in panel, two adjustable sunshades, four ash trays,

(Continued on page 55)

New paint job for 310B is seen here on a 310 (310B has two-tread step). Tip tanks for 100-gal. fuel capacity and 240-hp. Continental engines remain unchanged.
—(Cessna Photo.)

Cessna's New 310B Twin

WITH more than 550 Cessna 310 light twins in field service since the model was introduced in late 1954, Cessna Aircraft Company has announced its first improved version as the Model 310B. Deliveries will begin in August at a new $59,950 price, up $5,000.

Incorporating numerous improvements, the B model has a 4,700-lb. gross weight, as compared to 4,600 lbs. for the original model, but landing weight remains the same at 4,600 lbs. Empty weight has gone up, too, now being 2,965 lbs. as compared to 2,900 lbs. originally, so that useful load is up 35 lbs. at 1,735 lbs.

Revised performance figures are contained in factory data for the B model. High speed is listed at 232 mph. at sea level, as compared to 224 mph. at 2,500 ft. for the original model's high speed. Cruising speed at 70% horsepower and at 8,000-ft. altitude has been revised upward from 207 mph. originally to 213 mph. for the 4,700-lb. B. The new rate-of-climb figure has dipped from 1,700 feet per minute previously to 1,660 fpm., the single-engine rate of climb is higher at 415 fpm. as compared to 380 fpm. listed previously, the service ceiling is 500 ft. higher at 20,500 ft. and the single-engine service ceiling is 250 ft. higher for the B at 7,750 ft. All of these figures are for gross weight. Cessna's figures for the original 310 were intentionally conservative.

Engine power is the same—240 hp. each at 2,600 rpm. for take-off and normal rated power for two 6-cylinder 0-470-M Continental engines — and fuel capacity is the same at 100 gals. usable in standard tip tanks or 130 gals. usable with auxiliary capacity, which is optionally priced at $1,485 for factory installation.

Even with its increased gross weight, the 310B offers an impressive power-to-weight ratio with a power loading of only 9.8 lbs. per horsepower for high performance. A high wing loading of 26.9 lbs. per sq. ft.

Cessna Model 310B

Factory Data
July 2, 1957

Price	$59,950
No. Seats	5
Take-off Power, hp.-rpm.	480-2,600
Rated Power, hp.-rpm.	480-2,600
Gross Wt., take-off-landing, lbs.	4,700-4,600
Empty Wt., lbs.	2,965
Useful Load, lbs.	1,735
Av. Wt. for People, Baggage, Equipment with Std. Fuel, lbs.	1,075
High Spd., mph.-alt.,ft.	232-SL
Cr. Spd., mph.-% hp.-alt.-ft.	213-70%-8,000
Cr. Spd. for Max. Range, mph.-alt., ft.	169-10,000
Stall Spd., landing with flaps, 4,600 lbs., mph.	69
*Stall Spd., clean, 4,600 lbs., mph.	82
*Min. SE Control Spd., 4,600 lbs., mph.	92
Rate of Climb, fpm.	1,660
SE Rate of Climb, fpm.	415
Svc. Ceiling, ft.	20,500
SE Svc. Ceiling, ft.	7,750
Std. Fuel Cap., gals.	102
Optional Fuel Cap., total gals.	133
Engine Oil Cap., gals.	6
Cr. Range @ 213 mph., miles-gals.-hrs.	850-100-4.0
Cr. Range @ 213 mph., miles-gals.-hrs.	1,107-130-5.2
Cr. Range @ 169 mph., miles-gals.-hrs.	975-100-5.8
Cr. Range @ 169 mph., miles-gals.-hrs.	1,265-130-7.5
Span, ft.	36
Length, ft.	27
Height, ft.-ins.	10-5
Wing Area, sq. ft.	175
Wing Loading, lbs. sq. ft.	26.9
Power Loading, lbs. sq. ft.	9.8
Baggage, lbs.	200
Baggage Vol., cu. ft.	19

NOTE: All performance is for gross weight at sea level unless noted. *Not specified for 310B but factory data for Model 310 at 4,600-lb. gross. Single-engine service ceiling increases over 425 ft. for each 30 mins. of flight. ENGINES: Two 6-cylinder 0-470-M Continentals rated at 240 hp. at 2,600 rpm. each for take-off and normal operation. INSTRUMENTATION: Dual vacuum systems, gyro horizon and gyro direction indicator, electric turn and bank, rate of climb, sensitive altimeter, airspeed, lighted magnetic compass on rheostat, clock, dual electric tachometer, dual manifold pressure indicator, two engine gauge units (oil temperature, oil pressure, fuel pressure), dual fuel gauge, two cylinder head temperature indicators, electric free air temperature indicator, heated stall warning indicator, ammeter, heated pitot head, flap position indicator. CABIN EQUIPMENT: 35,000-BTU Stewart-Warner cabin heater (thermostatically controlled), windshield defoggers, two cigarette lighters, four ash trays, two dome lights, two sun visors, rear window curtains, outside baggage door, baggage compartment light, friction-lock engine controls, index-plate mixture control, red instrument post lighting (four-zone rheostat controlled), secondary rheostat, red and white flood instrument lights, fore and aft adjustable and reclining front seats, adjustable rear seat back, cabin loudspeaker, landing gear position lights, landing gear warning horn, gyro and vacuum test valve (four-position), fuel selector light on rheostat, turn and bank test light, four directional ventilators, eight cool air and heater outlets, map glove compartment, coat hangar hooks, 24 by 46 by 15-in. utility shelf, pilot storm window, four arm rests, red switch panel lights on rheostat, genuine leather trim, storage pockets. GENERAL EQUIPMENT: Two electric primers, 2 electric auxiliary fuel pumps, 2 engine-driven fuel pumps, 2 engine-driven vacuum pumps, 2 engine starters, 2 generators and voltage regulators, retractable double step, 24-volt battery, position lights and blinker, electric flaps and gear with manual auxiliary for gear, hydraulic toe brakes, dual fuel system, wing-tip fuel tanks, rudder-elevator and aileron trim tab position indicators and controls, parking brake, castering steerable nose wheel, left wing landing light, tinted windows, double rear windows, tow bar, four quick-drain valves, internal surface control lock, super soundproofing, choice of 8 color combinations, choice of 3 interior color combinations.

Optional individual rear seat chairs (above) and new contoured seats (below, right) in standard 310B are shown with this cutaway sketch, which reveals new seating, engine nacelles, split-type electric flaps, auxiliary fuel in wing, tip tanks, prop anti-icing and leading edge de-icing boots.

—(Cessna Sketch and Photos.)

(the 310 has only 175 sq. ft. of wing area, the same as the 4-place 172 and 182) gives it outstanding smoothness and comfort at its high speeds.

A compilation of the newest factory data is published with this article in its entirety. Eighty military 310B's are already being delivered to the Air Force.

Cabin refinements, featuring improved soundproofing and more versatile seating, highlight the new model, which also has a retractable double-step for entry. Windows and windshield are of one-quarter-inch thickness, some 14 lbs. of additional glass being used. An additional 21 lbs. of soundproofing material has also been used. The entire cabin structure, the wing root area, rear baggage wall and baggage door have received extra fiber glass and sealing against sound. Further noise reduction was achieved by an improved carpet seal and leather strips are used to seal off bulkhead perforations, control cable holes and all small openings.

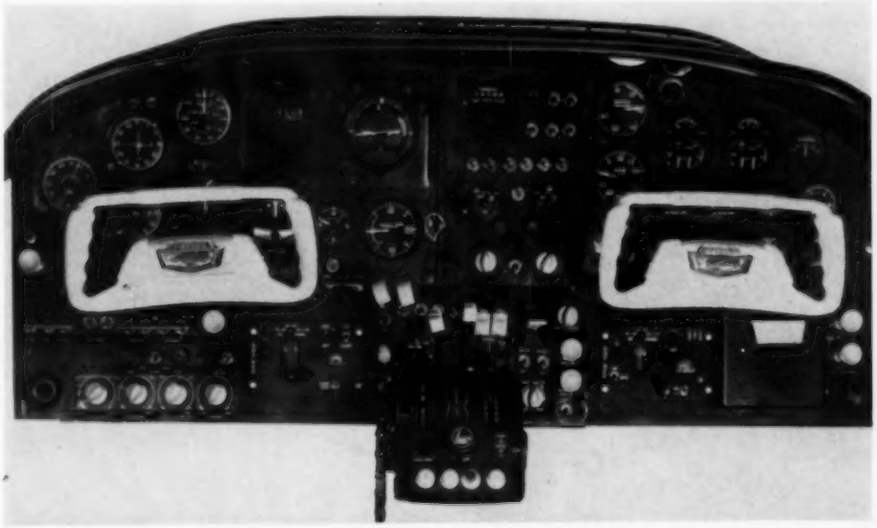
An improved 3-passenger rear seat reclines two inches farther than originally and has contoured headrest and seat back, with pillowfoam added under the rear cushion's foam rubber. Detachable armrests have been added.

Individual airline-type reclining rear seats are available as optional equipment. An armrest between them is easily removed for 3-person seating.

(Continued on page 54)

Cessna 310B's complete new black-finished instrument panel is shown below. All navigation and communications controls are at center. Red post lights are rheostatically controlled and divided into four panel zones. New shield eliminates glare on windshield from instruments.

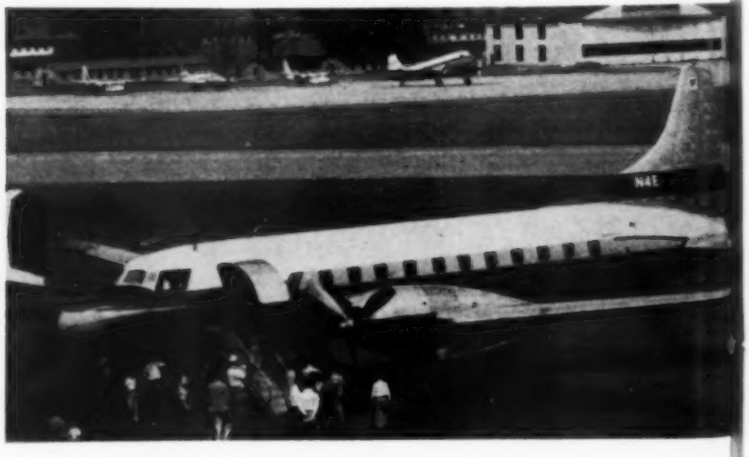
—(Cessna Photo.)



Aviation's annual classic display of business planes is provided by proud owners at Reading Aviation's 8th annual awards meeting. Some 53 single-engine planes, 20 light twins, 25 medium twins and 17 heavy twins competed; 398 planes were parked.

Cream of the crop of this year's corporate transports gathered at Reading Aviation Service. Howard Super Ventura is in foreground.

George Young's new Convair 440 for executive charter was best-equipped large transport. It is based at Washington, D. C.



Sime Bertolet, Reading Aviation Service president, is shown speaking at one of the event's forum discussions.

Flagship of the business fleet for 1957, top award winner in Reading competition, is this Douglas DC-3 of National Dairy Products, New York City.
—(All Photos by Reading Aviation Service.)

The Customer is King

National Dairy's Rip Strong (center) and his crew and ship (above). New at Reading this year was RCA radar installation in Aero Commander (below). With it are Sime Bertolet and Herb Shriner of TV and his wife.

WE used to think the greatest sight in the world as far as private aviation was concerned came off each year down in Florida on occasion of the old pre-war Gulf Oil Corporation aerocades when Al Williams furnished free gas to anyone flying cross-country to the Miami Air Maneuvers. If our memory serves us well we think we saw more than 1,000 light planes on one airport and hundreds more on others nearby around 1940.

That's nearly twenty years ago. And the only sight to come along anywhere near that multi-colored sea of aircraft in Miami was Reading Aviation's Eighth annual business aircraft awards meeting June 1 on the Reading, Pennsylvania, Municipal Airport, a field so green and so clean it looks more like a well kept park than it does an airport. About 398 airplanes lined the runways at Reading and they ranged from Howard Super Venturas and Convairs to Cessna 170's and Piper Tri-Pacers. Practically all of them were late model craft. We estimated the total value to be upwards of $8 million. What a far cry, we thought, from the slow and cumbersome clunkers of the 1930's!

Reading Aviation's successful one-day session consisted this year of an informative safety, operations and maintenance forum in the morning conducted by the Flight Safety Foundation; a gourmet luncheon served buffet style to all comers (this year some 1,600 people partook of this hospitality); demonstrations and exhibits of the latest aviation equipment and products of 32 aircraft and accessory manufacturers; and the Reading Aviation Service cash and trophy awards covering 17 categories which were judged by 10 qualified professional pilots. The technical sessions of the forum also included two discussions by CAA controllers on current traffic control problems. Appearing on the Flight Safety Foundation program were Jerome Lederer, FSF executive director; Bob Buck, TWA captain; K. R. Duee, Safe Flight Instrument Corporation; Randy Carpenter, air operations division of FSF and Joe Chase, FSF maintenance and equipment division.

In welcoming the crowd of airplane owners and pilots to this year's event, Reading aviation's president, Sime Bertolet, pointed out that there's lots of talk of an annual civil aircraft show to replace the old National Aircraft Show which became over-militarized and passed into oblivion last year. But while others talked, Sime said, Reading Aviation was staging one and would continue to build it up into an annual major aeronautical event. What impressed us most of all was the simple formula Sime and his cohorts have developed, namely, the customer

is king. For a long time now we've grown weary of attending meetings and conventions where the trade sits around and talks to itself and sales executives gather around booths and hotel rooms to see what the competitor has to offer, with only a smattering of customers about.

Perhaps the wisest ingredient of the Reading formula is recognition of the plane owner's immense pride in his plane and equipment. Nowhere on earth is the pride of ownership more apparent than in the business airplane world. The owner or pilot of a well-equipped, well-kept, modern airplane is about the most prideful animal there is. They are also good sports; it was very obvious at Reading that those who do not win were sorely disappointed. We're certain, too, that the unknown judges are quietly condemned to the fires of hell for passing over "my airplane" by many of those who bring their shiny craft in from all points of the compass. The judges have a mighty tough job and we don't envy them their responsibility. There are four awards in four categories, single-engine, twins under 5,000 pounds, twins between 5,000 and 12,500 pounds and twins over 12,500 pounds. Best exterior, best interior, best equipment and instrument presentation and best of class in each classification receive cash and plaques. This year an additional award was made for the best antique airplane but it failed to garner many entries.

Jerome Lederer of Flight Safety Foundation was among discussion leaders at the Reading forum.

Many industry exhibits at Reading included this Bendix Radio booth. Cocktail party group below includes Dick Finke, Bendix Radio; C. J. Melville, Reading Aviation; Dick Blazius, Bendix; Norman Van Dine, MacMillan; Ed Lynch, RCA; Bill Russell, Lycoming, and Don Humphreys, MacMillan. Beneath Grumman wing below right are Bob Pruitt, Bill Strohmeier, Betty Wolfe and Nancy Narco.

Reading Aviation Awards were distributed as follows, with airplane, owner and pilot in that order:

FLAGSHIP OF THE BUSINESS FLEET: Douglas DC-3 owned by National Dairy Products, New York; W. R. (Rip) Strong, captain.

TWIN-ENGINE, OVER 12,500 LBS.: *Best Equipped*—Convair 440, Fairways, Inc., Washington, D. C., George F. Young. *Best Interior*—Douglas DC-3, Huessler Aviation, Buffalo, N. Y., Jack Prior. *Best Exterior*—Douglas DC-3, National Dairy Products, New York, W. R. Strong. *Best of Class*—Douglas DC-3, National Dairy Products, New York, W. R. Strong.

TWIN-ENGINE, 5,000-12,500 LBS.: *Best Equipped*—Aero Commander 680, James T. Harrison, Wichita Falls, Texas, W. R. Brand. *Best Interior*—Aero Commander 680, James T. Harrison, Wichita Falls, Texas, W. R. Brand. *Best Exterior*—Aero Commander 680, Lukens Steel Co., Coatesville, Pa., W. F. Austin. *Best of Class*—Aero Commander 680, James T. Harrison, Wichita Falls, Texas, W. R. Brand.

TWIN-ENGINE, UNDER 5,000 LBS.: *Best equipped*—Cessna 310, Ed Chadderton, Sharon, Pa. *Best Interior*—Cessna 310, Ed Chadderton, Sharon, Pa., *Best Exterior*—Cessna 310, Radio Corp. of America, Wilmington, Del., Frank Pearson. *Best of Class*—Cessna 310, Ed Chadderton, Sharon, Pa.

SINGLE-ENGINE: *Best Equipped*—Cessna 182, Ed Chadderton, Sharon, Pa. *Best Exterior*—Piper PA-12, J. Gerald Cassel, Palmyra, Pa. *Best of Class*—Cessna 182, Ed Chadderton, Sharon, Pa.

ANTIQUE AIRCRAFT: *Best Restored and Flyable Antique Aircraft*—Tie between Brunner-Winkle Bird, owned by Capt. R. B. Talbot, Marine Corps, Fort Lee, Va., and a 1927 OX-5 K-31, owned by Ernest Buehl, Bucks County, Pa.

Best of class, best equipped and best interior winner in 5,000-12,500-lb. class was this J. T. Harrison 680 Aero Commander, Wichita Falls, Texas. Bill Brand is shown.

Best exterior award in 5,000-12,500-lb. class went to 680 Aero Commander owned by Lukens Steel. Shown are Bill Austin, Skip Sherman.

Ed Chadderton of Sharon, Pa., won best of class, best equipped, best interior awards with this Cessna 310 in light twins grossing under 5,000 lbs.

Best exterior award among light twins went to this Cessna 310 of RCA at Wilmington, Delaware, shown with Pilot Frank Pearson.

Ed Chadderton's Cessna 182 from Sharon, Pa., was best of class and best equipped single-engine entry.

Gerald Cassel, Palmyra, Pa., won best exterior award for single-engine planes with this pretty Piper PA-12.

DETAILS OF WINNING EQUIPMENT: Both George Young's executive Convair 440 and Huessler Aviation's DC-3 have interesting details. Young's Convair has the new Collins AP-101 autopilot with integrated flight system, RCA radar, Narco DME, Collins 618S high-frequency, 144-channel transceiver with world-wide frequencies and extra long range, dual Collins 17L-6 and 51-X1A VHF communications, dual Collins 51R-3 omnis, dual Collins 51Y-1 ADF's, 3-light Bendix marker beacon, cabin amplifier and intercom system, Nordscog Swissair galley (its automatic coffeemaker can purify water obtained on foreign ports), Burns seats (32 belts for passengers), Aircruisers 20-man life raft and vests, CO-2 escape chute, Andover 200-amp auxiliary power unit linked direct to the bus bar, Pacific Airmotive long-range fuel and oil (2,100 gals. of fuel for 2,700-mile maximum range), two SAFT nickel-cadmium lifetime, sealed-unit batteries with battery-operated communications and navigation receivers, and custom Horton & Horton interior. Young gave credit to Associated Radio of Dallas for his custom radio and electronic installation, to Pacific Airmotive for his long-range fuel system and auxiliary power unit, and to Horton & Horton of Ft. Worth for his interior. He started his Fairways, Inc. charter business five years ago at Washington National Airport with a D18 Twin Beech and now operates the Convair 440 and two DC-3's on worldwide charter, logging 1,500 revenue hours last year. The 250-mph. Convair charters at $2 per mile and $1.25 per ferry mile and the 197-mph. big-engine Douglases at $1 and 65 cents, "live" with crews.

The Huessler Aviation DC-3 which won Reading's best interior award and was runner-up for flagship honors, was described to FLIGHT MAGAZINE by Jack Prior, captain, as an outstanding Remmert-Werner deluxe conversion designed for maximum passenger comfort. With 14 passenger seat belts, it has two 3-place divans in a curtained forward section; four swivel chairs at the center and four individual seats with a table aft. The cabin has four 15 by 56-in. picture windows, an imported English cigar humidor and an electric stair door. Equipment includes the new Collins AP-101 autopilot with integrated flight system, Bendix radar, three compass systems (gyro, magnetic and standby), plug-in Loran for over-water trips, complete dual airline-type communications and navigation radio and electronics, auxiliary outboard tanks with 1,100-gal. capacity for 2,400-mile range, Dash 94 engines with 2-stage supercharging and will soon get Remmert-Werner gear doors. Prior gave credit to Remmert-Werner for an outstanding job, with Charles F. Wolfe of Huessler Aviation in charge of maintenance, and said R-W finished the turnkey job in only 71 days.

(Continued on page 53)

Gilley Aviation's C-1 Skimmer on the ramp at Lafayette. Curtiss Gilley keeps the 120-125-mph. amphibian busy flying oil tool specialists to isolated drilling rigs in the Louisiana coastal marshes.

Bayou Baby

By TOM ASHLEY
FLIGHT MAGAZINE PHOTOS

THE Colonial Skimmer, a $16,750 3-place 150-hp. all-metal amphibian which languished for years in the design and development stage until a small group of ex-Grummanites put it into production last year at Colonial Aircraft Corp., Sanford, Maine, is proving to be a dependable workhorse airplane in the Louisiana swamps along the oil-rich Gulf of Mexico coast.

"This bayou baby's got what it takes," is the way Curtiss Gilley, operator of Gilley Aviation Service, Lafayette, Louisiana, described his Skimmer to us as he turned into final approach for a landing in a small, snag-filled, mud-colored lake umpteen miles from nowhere in the mammoth swamps.

An oil derrick on stilts loomed ahead. Gilley held the Skimmer off the water until he was right up on the towering pumper with its huge storage tanks.

"It stops on a dime," he said, chopping the power while the little hull slipped onto the water in a touchdown equivalent to a wheel landing on a silk-smooth runway. We didn't use 600 feet before stopping and had to taxi quite a way to reach the derrick.

There was no wind and the take-off was impressive because the Skimmer, unlike many amphibians and seaplanes, isn't pulled out of the water—it likes best to fly itself out. Give it back pressure and it just stays there. Leave it alone and it climbs upon the step by itself in no time, skims along without fuss or noise for 1,800 feet or so until it reaches about 60 mph. and then lightly slips off the water's surface and into the air. There's none of the familiar struggle to unglue the hull from water suction, no nursing or jockeying.

On land, the Skimmer will get off in 550 ft. and land in 450 ft. Stall speed, landing with flaps, is 50 mph.,

Nose or wing is walkway to Skimmer's 3-place cabin. Note retracted nose wheel's position as bumper for docking.

and clean is 58 mph. It climbs at 600-700 fpm. With a 1,410-lb. empty weight and a 2,150-lb. gross, it has a 740-lb. useful load. Fuel capacity is 40 gallons.

Gilley says he averages 110-mph. indicated air speed at 4,000 ft. with 2,350 rpm. and 24 ins. of manifold pressure. This is in smooth air. In rough air, the indicated air speed at this setting is about 105 mph. at 1,000 ft. This is at a fuel consumption which averages about 10 gals. per hr. for the powerful little 4-cylinder Lycoming. With some altitude, up around 8,000 ft., the trip average drops to about 8.5 gals. per hr. with leaning.

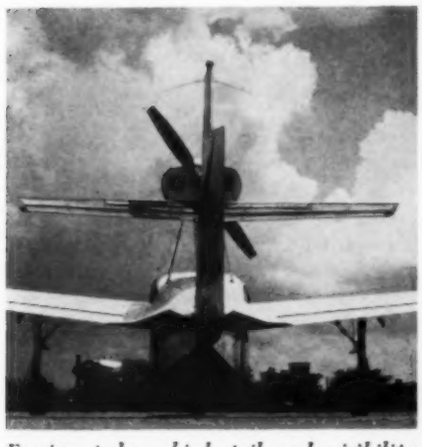
"It is 180 miles from my base in Lafayette to the mouth of the Mississippi River below New Orleans and I frequently fly down there, stop at a couple of oil rigs, and return on 40 gallons, without refueling anywhere," Gilley said.

He said the Skimmer's pusher propeller installation makes little difference, as far as he can tell, in the handling of an airplane. Engine cooling is excellent, he said—in climbs, cruising at any power and at all times.

Portrait of a climb-out shows Skimmer's pretty lines.

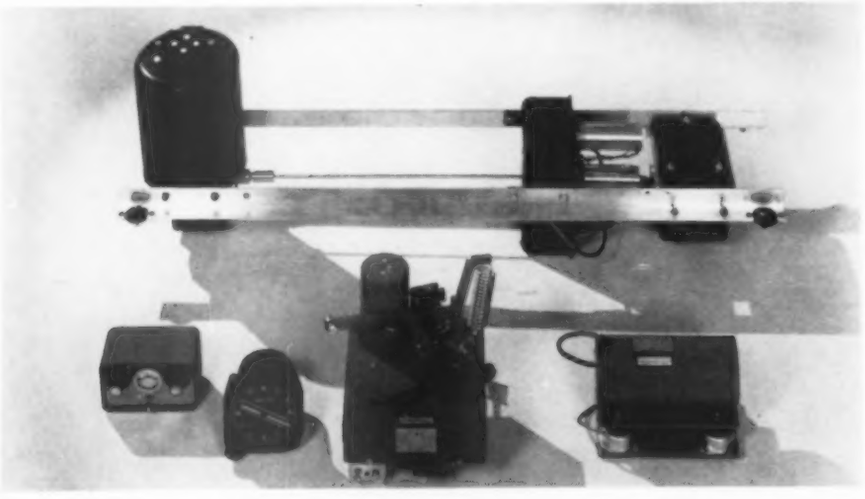
He likes the little cabin layout. It is unusually large for a 3-place airplane. So large, in fact, that there is talk of replacing the 150-hp. Lycoming with the newer 180-hp. Lycoming 4-cylinder 0-360 and making a 4-place out of the Skimmer. "All they'll have to do is move the front seats a little forward and replace the existing single rear seat, which is sideways, with a forward-facing 2-place seat, and they'll have one of the finest, most useful 4-place airplanes ever offered anybody," the operator said. Cabin dimensions are 62 inches long by 44 inches wide by 44 inches high and it is a long way from the

(Continued on page 55)



Engine pylon, high tail and visibility of Skimmer are emphasized in these pictures, the oil derrick below being seen through the right windshield while water-taxiing. At 2,150-lb gross, 150-hp. Skimmer has 740-lb. useful load.

Command console of Globe Mark II autopilot, mounted on control wheel, weighs only half a pound and measures only 4 ins. wide, 2.5 ins. high and 2 ins. thick. The bracket assembly below contains heading/lock magnetic compass and signal amplifier assembly. Below it, left to right, are command console, remote compass indicator, servo and rate gyro. Total installed weight is 26.6 lbs.



Magnetic Heading-Lock Autopilot

GLOBE Industries, Dayton, Ohio, is now delivering a new two-control autopilot for lightplanes, the Globe Mark II, the heart of which is a specially-designed precision magnetic compass dampened to counteract northerly turning error.

CAA approved for installation in Cessna 170, 172, 180 and 182 models and Piper Tri-Pacers, the new system is built around the Globe Gyro/Stabilizer Mark I, the heart of which is a rate gyro for inherent spiral stability.

With the Mark II, the pilot sets any magnetic heading into the system and it is "memorized" until changed purposely, the aircraft locking onto the heading and flying it automatically. Use of a magnetic compass for heading control avoids the gyro's drift characteristics and the Mark II's magnetic compass was specifically engineered for autopilot application and is independent of existing instrumentation.

Both the earlier Mark I Gyro/Stabilizer and the new Mark II are compatible building blocks leading to a full autopilot for business planes. Each unit is planned to supplement earlier parts of the system.

The Mark II sells for $1,350 and includes the Gyro/Stabilizer, heading/lock, command console and all installation parts such as plug-in electrical cables, brackets and fittings, with an optional remote compass indicator system priced at $95.

Globe has opened a new airport facility at Dayton Municipal, with Gene Weaver in charge, and is installing the equipment and checking it out for dealers and operators. Flat rate labor charges include $125 for Mark II (3 days); $125 for heading/lock (includes labor for complete overhaul of the G/S already in the plane; parts are extra; allow 3 days) and $75 for Gyro/Stabilizer (2 days).

Those who now own a Gyro/Stabilizer may add a Mark II to their existing unit. Cost for the conversion kit is-$725 and includes heading/lock assembly, command console and all installation parts together with full instructions. The G/S sells for $675.

The Mark II control compass is located aft of the baggage compartment, 18 ins. away from local magnetic and electrical interference, and thus becomes the most accurate compass in the aircraft.

Controls include a dash-mounted push-pull control to engage the unit and a compact, small command console mounted on the hub of the aircraft control wheel. A function switch places the unit on standby (STBY), Gyro/Stabilizer (G/S) or heading/lock (H/L). With the switch on STBY, the remote compass indicator is operative while the remainder of the system is ready for use. With the function switch on G/S or STBY and the push-pull control engaged, flight is automatically controlled by a rate gyro, which provides short-term heading sense and inherent spiral stability. To make stable, controlled turns, the trim-turn knob is moved left or right, automatically placing the aircraft in a turn up to a rate of 3 deg. per sec.

To lock the aircraft onto a magnetic heading, the pilot uses the trim-turn knob to achieve essentially straight flight on the desired heading. This heading is set into the system by centering the needle of the heading trim meter with a trim switch. The heading is then locked into the system by moving the switch to H/L.

The Mark II achieves heading control through a feedback system which corrects the heading by rudder operation. When a heading error is sensed by the light-sensitive (photo electric) pick-offs in the compass, the signal is amplified and fed to a control servo which immediately induces an error signal in the basic G/S system. The heading error is corrected through deflection of the rudder. Unlike a full autopilot, the 2-control Mark II does not control the pitch axis.

Total installed weight of the Mark II is 26.6 lbs., broken down as follows: G/S components (rate gyro 4.1 lbs., servo 5.5 lbs., brackets, hardware, etc. 5 lbs.) 14.6 lbs., and magnetic heading/lock components (magnetic compass and amplifier assembly 9.7 lbs.; command console 0.5 lb., optional remote compass indicator 0.8 lb., and electrical cables 1 lb.) 12 lbs. total all components 26.6 lbs.

Current consumption is normally only 1.3 amp., with a possible maximum of 4 amp.

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WE'VE come a long way in 9 years — thanks to customer satisfaction. From 3 men our personnel has grown to 40 — the best team of skilled aircraft radio technicians available anywhere. . . . Our facilities have grown to include the finest available selection of complete test equipment. . . . In 9 years we have completed a total of 5,903 separate work orders, each the successful solution to a valuable customer's problem.

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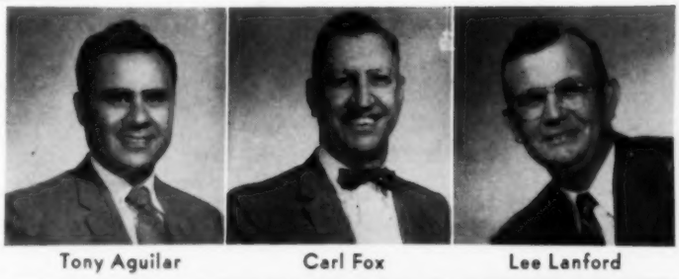
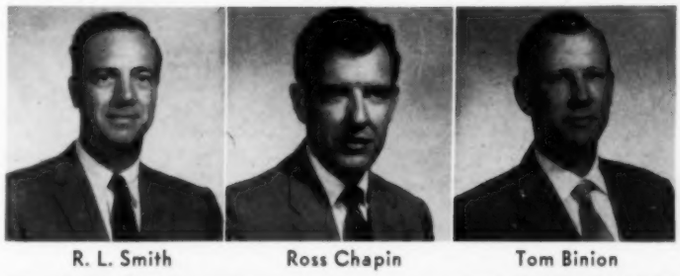
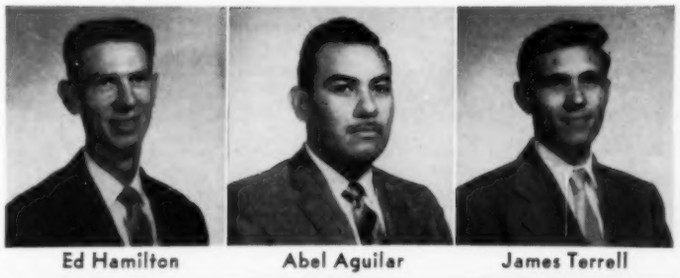
Wherever you are, whatever your aircraft radio and electronic needs, Associated Radio solicits your inquiries and welcomes your business.



Tony Aguilar | Carl Fox | Lee Lanford



R. L. Smith | Ross Chapin | Tom Binion



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General Aviation Facilities Requirements Survey

A report to the President's Special Assistant by the General Aviation Facilities Planning Group

Part 2-A

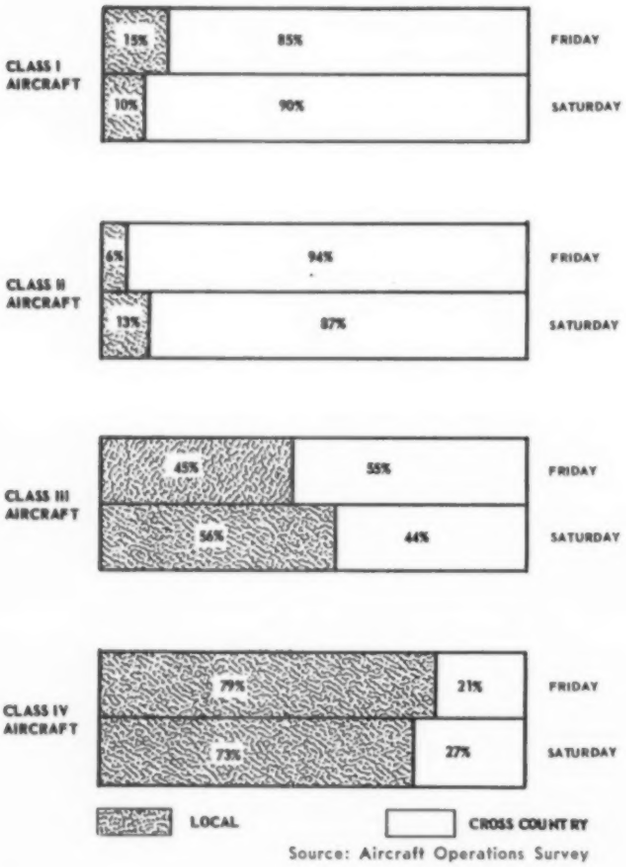
Cross-Country Flying Patterns Of General Aviation

EDITOR'S NOTE: The above-titled special report to President Eisenhower's special assistant for aviation facilities planning, Edward P. Curtis, holds such significance in the broad field of general aviation that FLIGHT MAGAZINE is publishing its full text. This survey of general aviation requirements was prepared and submitted by the General Aviation Facilities Planning Group, in which eleven national organizations banded together to document the important and growing field of general aviation (as distinguished from airline and military aviation). Special credit goes to them for the report, and to the well-known firm of Booz, Allen & Hamilton, which coordinated and directed the research studies. Part 2 was published last month; Part 3 will appear next month.

ALTHOUGH the actual number of cross-country operations in relation to total operations is relatively small, the nature of these flights is significant to the development of air space controls outside of the major hub traffic areas.

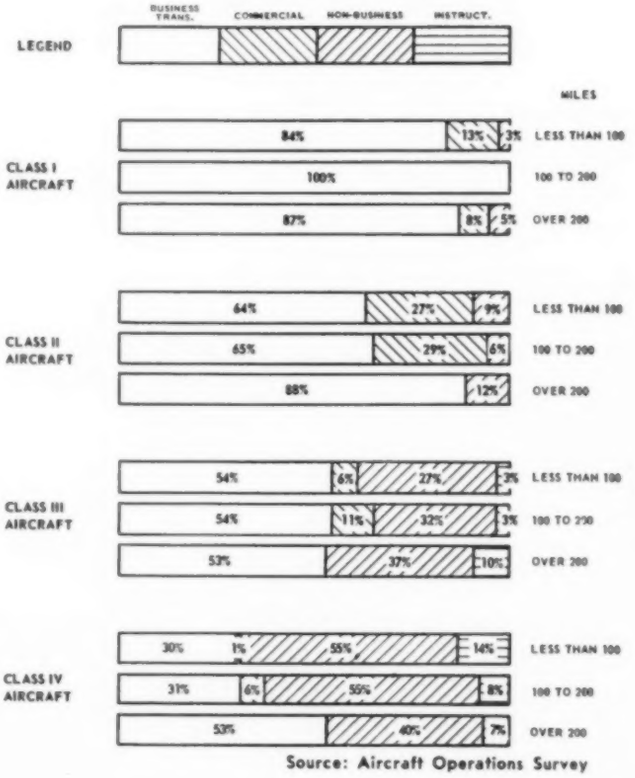
The higher the performance class of the aircraft, the more cross-country flying is done. Most multi-engine aircraft flying is cross-country. As would be expected, Class I and Class II aircraft are typical cross-country aircraft. Class III and Class IV aircraft tend more to confine their flying to local areas, and their cross-country trips are generally shorter than those flown by Class I and II aircraft. However, although these lower performance aircraft are flown less cross-country, their total fleet size is so great that they make up the greater share of aircraft in cross-country flight. Table 37 presents a frequency distribution of

Table 38
CROSS-COUNTRY VS LOCAL FLYING ON WEEKDAYS VS WEEKENDS
PERCENT OF OPERATIONS BY AIRCRAFT CLASS



Source: Aircraft Operations Survey

Table 39
PURPOSE OF FLIGHTS BY AIRCRAFT CLASS AND DISTANCE OF FLIGHT



Source: Aircraft Operations Survey

Jack Gregson, Mennen's good-will ambassador, is seen on the "Wednesday Night Fights," (ABC-TV network) and the Robert Montgomery Show. Jack, a pilot for 22 years, flew DC-4's during World War II, is now flying his second Tri-Pacer.

"YOU CAN'T BEAT THE Tri-Pacer"

says JACK GREGSON, *well-known TV star and veteran pilot*

"For my money, the Piper Tri-Pacer is tops. There's just nothing in its class that will match it for performance, flight characteristics and handling ease. Having flown four-engine transports on the Pacific run during World War II, I have a lot of respect for the Tri-Pacer's stability and 'big airplane' feel when the going gets rough. And there's no instrument pilot who doesn't appreciate the special attention Piper has paid to placing the instruments and radios right where you want them. The Tri-Pacer is really a good airplane that experienced pilots appreciate.

"Comfort-wise the Tri-Pacer is quiet, roomy and has ideal temperature control. Two heaters keep the cabin at living room temperature when it's below zero outside, and five cool air vents keep you cool in the summer. I'm six feet two, but the individually adjustable front seats assure perfect comfort.

"Dependability is the final thing I like about the Tri-Pacer. Everyone knows the Lycoming 150 horsepower engine is the finest private plane powerplant available and, after flying behind it for three years, I can't speak too highly of the peace of mind the Lycoming gives you. From every point of view, you just can't beat the Tri-Pacer!"

YOU'LL agree with Jack Gregson when you fly the exciting, new Piper Tri-Pacer. 150 horsepower, over 130 mph cruising speed at 7000', simplified controls, tricycle landing gear. Only $7,830, priced far less than any other four-place business plane. See your Piper dealer or, for full-color brochure, write Dept. F-7.

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LOCK HAVEN, PA.

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

the incidence of cross-country flying by class of aircraft as stated by owners and regular pilots of these aircraft. Eighty-three per cent of the aircraft in Class I and Class II are said, by their owners or regular pilots, to be flown more than 75% of the time in cross-country operations. These percentages drop off sharply as we move to the lower performance classes.

The relationship of cross-country flying to local flying by each class of aircraft appears to be similar on weekdays and on weekends. Table 38 displays this relatively similar incidence cross-country flying by class of aircraft whether on weekday or weekend, and again emphasizes the fact that the manner and purpose of usage of an aircraft are related more to the class of that aircraft than to the time and place of such usage.

Table 39 points out that a high percentage of the cross-country flights by the large aircraft is for business transportation. A high percentage of the smaller aircraft is being used for other purposes. These data were obtained during the two-day survey of aircraft operating out of the Chicago hub.

Table 37

DISTRIBUTION OF CROSS-COUNTRY FLYING BY AIRCRAFT CLASS

	Per Cent of All Aircraft of Each Class	Fly Cross-Country This Per Cent of Total Annual Hours
Class I and II Aircraft	83%	76%-100%
	8	51 - 75
	5	26 - 50
	4	0 - 25
	100%	
Class III Aircraft	58%	76%-100%
	22	51 - 75
	16	26 - 50
	4	0 - 25
	100%	
Class IV Aircraft	32%	76%-100%
	21	51 - 75
	28	26 - 50
	19	0 - 25
	100%	

Source: Aircraft Owners' Survey

Weekend cross-country flying emphasizes flights by Class III and Class IV aircraft. The data of Table 40 point up the decreased use of Class I and II aircraft—the big cross-country business planes—on weekends and the corresponding build-up of cross-country flying on weekends by Class III and IV aircraft whose pilots have more available time on Saturday and Sunday.

Most cross-country flights are less than 200 miles. The pattern of cross-country flights by distance is presented in Table 41 for three selected hubs during the two-day survey.

It should be noted that these distances are the distances to the next landing point rather than total trip distance. The influence of lower performance aircraft is noted in the variation between Friday and Saturday ratios.

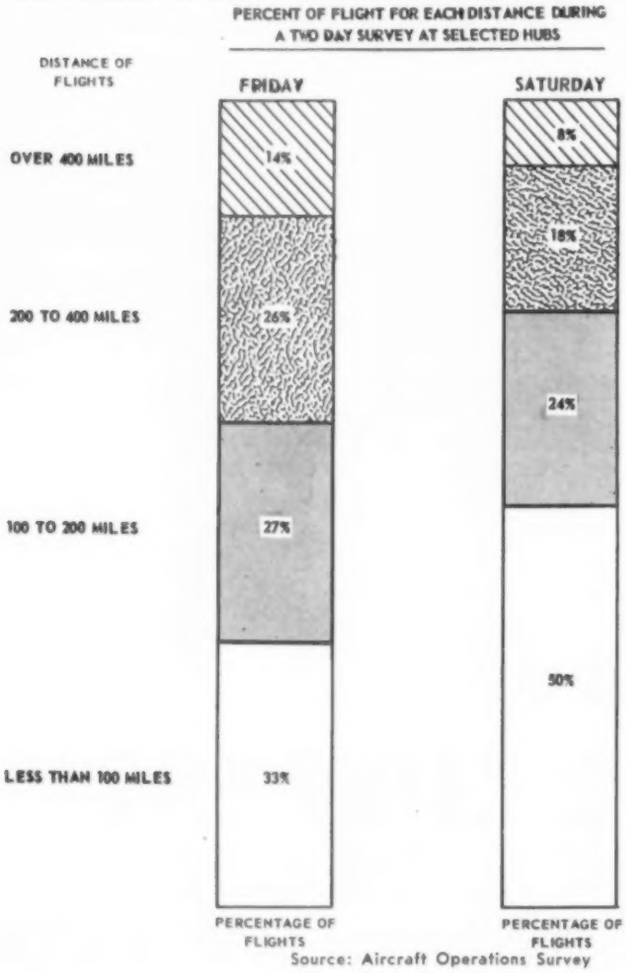
This pattern of distance shows no basic dissimilarity from hub to hub other than certain local peaking in a specific distance bracket from a hub caused by the location of a popular destination at that distance from the hub.

General support for this distance pattern comes from an earlier survey conducted for an aircraft company showing the distribution of distances from the airplane base to those places regularly visited by airplanes of 128 businesses. This distribution is shown in Table 42 and ignores, first, the fact that nearby locations were visited more frequently and, second, that most of the remote points were reached after one or more landings en route. Adjustments for these two

(Continued on page 39)

Table 40

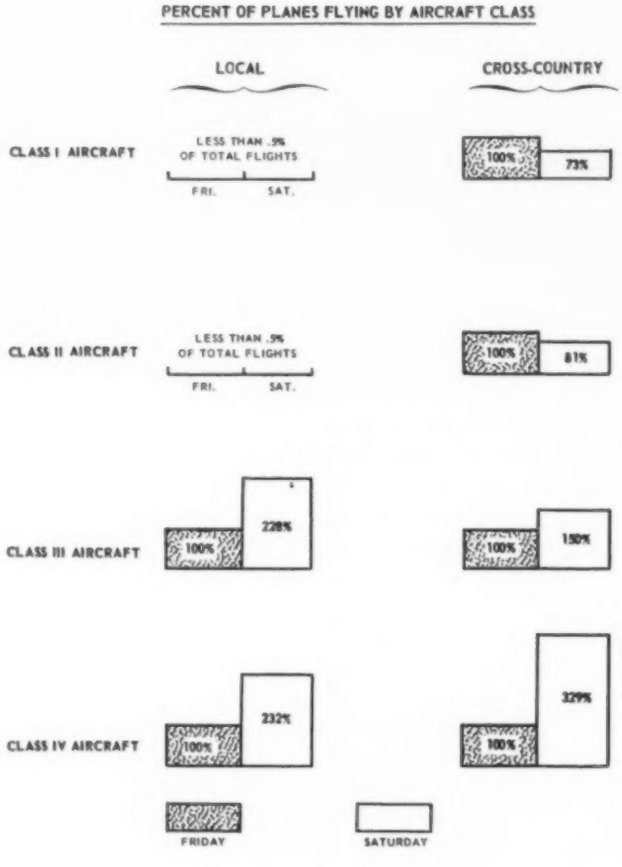
COMPARISON OF A WEEKEND DAY VS WEEKDAY FLYING



Source: Aircraft Operations Survey

Table 41

DISTRIBUTION OF CROSS-COUNTRY FLIGHT DISTANCES



Source: Aircraft Operations Survey

Chief pilots Frank M. Briggs and Richard Vinal (L/R) discuss with Fisher extensive flight testing with Champions. Veterans of 22 years with Pan American World Airways, the two captains are responsible for all Miami test flights for the "World's Most Experienced Airline."

Another in a series on the care taken by leading airlines to maintain top flight efficiency—and why this care has led them to select CHAMPION SPARK PLUGS. Noted aviation authority reports on Pan American World Airways . . .

"World's Most Experienced Airline"

by **HERB FISHER**

international aviation authority, veteran test pilot, and author

HERB FISHER

Just Over the Horizon . . .

Crowning the gigantic Pan American World Airways Maintenance and Overhaul base at Miami International Airport—like a royal crest of honor over this gateway to Central and South America—are these brilliantly lighted words: "World's Most Experienced Airline."

No airline slogan has commanded more unqualified global respect. Since the maiden flight of its Jenny-type Fokker F-7 tri-motor "Clipper" 30 years ago, Pan American has distinguished itself with a singular history of world-wide aviation development and airline safety.

Pan American pioneered transoceanic routes to South America, Europe and the Orient. Its famous Clippers have flown more than 700,000,000 miles—equivalent to 28,000 trips around the globe. PAA has carried well over 10,000,000 commercial passengers to and from six continents and 82 countries and colonies over the Earth.

Pan American told me it has received more awards than any other airline—tangible testimony to an excellence of performance based on experience in operation and maintenance. In international aviation circles, Pan American has become synonymous with efficiency and safety experience.

Receiving a cordial invitation, I spent several days inside PAA's Miami Overhaul Base (MOB), delving into why Pan American maintains a top position in the air transport industry. This overhaul base occupies 50 acres, 30 under roof, and employs some 2,500 year-round workers. It's the largest airline overhaul plant in the world . . . home base for Pan American's headquartered Latin American Division fleet, serving Central and South America, as well as overhaul center for PAA's Atlantic Division, covering Europe, Africa and the Middle East.

Establishment of MOB in 1948 marked another historic first for Pan American: first time a mass-production, factory-method operation in airline aircraft maintenance had ever been tried. Now, with more than 10,000 engines alone having been overhauled there these past eight years, MOB is an airline industry model.

Each of Pan American's 135 multi-engine aircraft comes in biennially for complete disassembly—Boeing Super Stratocruisers, Douglas DC-4's, DC-6B's, DC-7B's, DC-7C's, Convairs. The whole ship is dismantled and reconditioned from wing panels to cabin carpeting. Engine parts, for example, are chemically and mechanically cleaned until not a vestige of dust or baked-on carbon remains. Parts are then minutely examined with the most modern inspection equipment to insure their soundness and suitability for reuse. Throughout reassembly stages, each unit is tested for operational perfection.

Like ships of sea, giant Clippers of Pan American, too, must come in for a "dry docking" to insure maximum public safety. They're completely disassembled and reconditioned. A special 75-ton dock of movable and stationary sections was designed by PAA to handle this double-deck "Strato" Clipper, largest commercial airliner in operation.

Self-explanatory are these safety reminders, which Fisher observed throughout the Miami Overhaul Base. Maximum safety efforts from the ground up – up to the stars – put teeth in the slogan, "World's Most Experienced Airline."

Veteran pilots and crew members get constant refresher courses to keep them at peak efficiency. They're required to spend many hours in this "flight simulator," a classroom cockpit duplicating flight conditions.

. . . But, in the Beginning . . .

"World's Most Experienced Airline". . .

a special report for Champion Spark Plug Company

A look at the immediate future with a nostalgic glimpse into the pioneer past is provided by these two Clippers, the pride of their respective eras. Representative of *Tomorrow's* Clipper is this Douglas DC-8 jet. Pan American's jet Clipper fleet — Boeing 707's and DC-8's — is scheduled for service in 1959 and will transport up to 150 passengers per plane at speeds around 600 mph. *Yesteryear's* Clipper, this Sikorsky S-40, was the first PAA plane to bear the now-famous "Clipper" title . . . also the world's first four-engine commercial seaplane. It was delivered to Pan American 26 years ago.

Finally, the completely reconditioned engine is tested on one of Pan American's giant engine test stands for multiple assurance of functional perfection.

Engine Overhaul at MOB occupies a seven-acre building, where up to 300 engines per month can be completely reconditioned. Ignition system overhaul is done in the Accessory Overhaul building, a structure almost as large as Engine Overhaul.

As a pilot, you're not long in the driver's seat behind an engine before you realize the heart of a powerplant is its ignition system. Having spent more than 12,000 hours aloft behind hundreds of engines, I was most anxious to inspect Pan American's Ignition Overhaul. Here, Pan American reconditions everything from magnetos to spark plugs.

The spark plug, of course, is the vital powerplant life-giver upon which all other plane parts are dependent to stay aloft and safely power millions of passengers millions of miles through all kinds of atmospheric conditions.

As I observed installation of spark plugs in the many types of overhauled engines, the very capable manager of MOB, Santos Ceyanes, explained: "We've used Champion Spark Plugs for years. Occasionally we test other plugs, but we always return to Champions. We fly Champions an average of 350 hours between removals. We've never found a better spark plug, and we've tested them all, extensively. Reliability and performance dictate Champions as our necessary choice. Long life, service and economy bolster those vital requisites of choice."

In selecting a spark plug for an aircraft engine, the engine manufacturer first runs exhaustive tests to determine what plug best meets heat-rating and other operational requirements of the engine, William W. McClintock, powerplant engineering superintendent, told me. Then, a limited quantity of the appropriate plug is released to the airline for flight evaluation. A history of the plug's characteristics—performance, reliability, gap erosion, total life, ease of reconditioning, etc. —is recorded throughout testing. Spark plug histories are carefully compared with those from tests of other spark plugs.

"Champions have surpassed other plugs in these tests since we began using Champions in 1943," Mr. McClintock said. "We find, for example, that Champions give us less lead fouling and electrode erosion while maintaining excellent ceramic stability. MOB-overhauled engines have accumulated millions of high-efficiency hours while using Champions."

As powerplant engineering installation supervisor, Morton H. Woolf heads the engineering staff charged with evaluating ignition system test results. With cold objectivity, then, he selects Champions.

Handy with a tape recorder, Fisher talks to Santos Ceyanes, manager of the Pan American Miami Overhaul Base, about the magnitude of overhaul and maintenance that has contributed to PAA's well-earned safety slogan, "World's Most Experienced Airline."

Douglas A. Shropshire (L), Champion aviation representative, gives technical assistance to (L/R) G. F. Sheppard, an Electronics general foreman, and Clyde Walkup, assistant Ignition Overhaul foreman.

When engines have been reconditioned right down to the last nut, bolt and spark plug, they're reassembled and tested in this Engine Test Cell.

An extra safety precaution is taken by Flight Engineer W. F. Kellegrew, a 15-year Pan American veteran who takes nothing for granted: he double-checks his wing-tank fuel supply preparatory to taking off for Latin America. Airborne, he feels secure behind engines equipped with Champion Spark Plugs.

According to L. R. Sayre, a 27-year Pan American veteran and assistant service superintendent, the calculated decision to use Champions has been remade every year since the original decision 14 years ago.

Henry Mossberger, powerplant engineer directly responsible for ignition engineering problems, told me how the Champion Spark Plug Company has "given every cooperation and assistance" in extending the spark plug lifetime sufficiently beyond that of other plugs, providing the ideal combination of plug economy and reliable performance. "After hours of exhaustive extended-life service tests, we find the die-hard Champion without equal."

At this point, I had been thoroughly checked out in the operation of PAA's massive Miami Overhaul Base by an efficient staff. I'd seen the great Clippers of the "World's Most Experienced Airline" disassembled and reconditioned right down to the last spark plug.

And, in the end, I know—being an old test pilot myself—that it is the pilot himself who has the real throttle-hand appreciation of the engine. Capt. Richard Vinal, assistant chief pilot, technical, and a 22-year PAA veteran, confirmed my feeling: "I run flight tests, demonstration flights and performance checks. In these, we've used Champions for many years. They're unequaled. Herb, I use them in my car—and even in my lawn mower."

Capt. Frank M. Briggs, Latin American Division chief pilot, added: "In my 22 years with Pan American, I've logged more than 16,000 hours—mostly on Champions. Everyone knows the high safety record Pan American has, and, quite naturally, we've guaranteed this safety experience to the public with use of the best possible parts and equipment. Herb, I feel very strongly about the success we've had with Champions."

Over-all, the importance of a vendor's cooperation, and Champion's in particular, was summed up by R. D. Charles, MOB assistant superintendent of overhaul and a 27-year PAA veteran: "Champion's close cooperation and efforts to constantly improve the product—new insulators, for example, and lighter type construction, incorporating the best materials—point up the fact that we are using one of the finest products in the field."

Wherever I went and with whomever I talked there at MOB, the reasons for using Champions became increasingly obvious. Service, reliability, long life and economy seem to sum up Pan American's reasons for unanimous Champion preference.

—by HERBERT O. FISHER

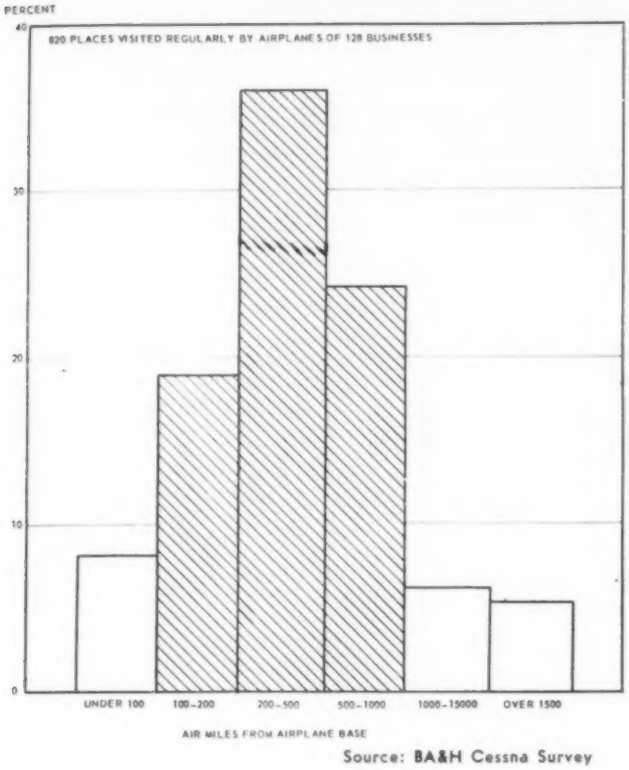
Discussing engineering tests are (L/R) William W. McClintock, Powerplant Engineering superintendent; M. H. Woolf, Powerplant Installation Engineering supervisor; Fisher; and H. I. Mossberger, Powerplant engineer.

"Champion's close cooperation and efforts to constantly improve their product point up the fact that we're receiving the finest spark plug in the field," R. D. Charles, assistant Overhaul superintendent and a 27-year PAA veteran, tells Fisher.

A. S. Galbraith, Division Supply Manager, LAD-PAA: "Cost, quality and service life determine product selection. All three factors apply to Champions."

Table 42

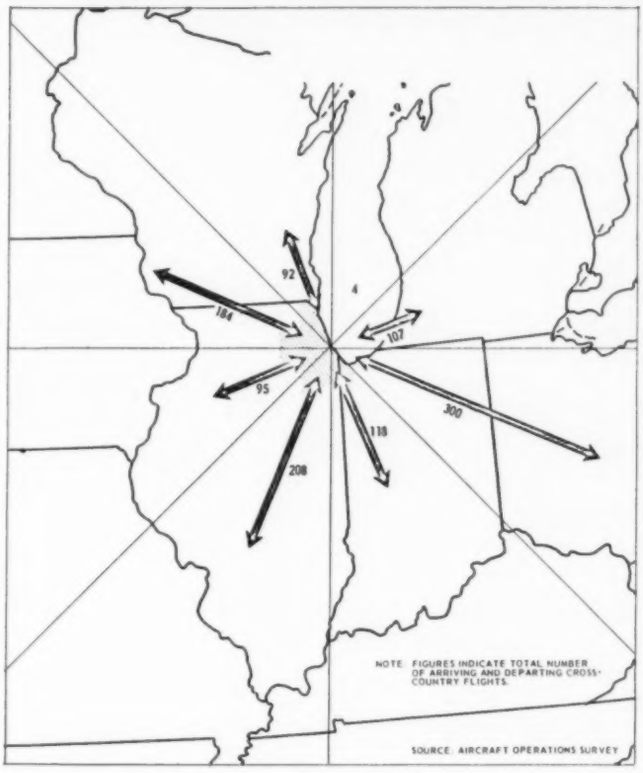
ANALYSIS OF TRIP LENGTHS FOR COMPANY-OWNED AIRPLANES



Source: BA&H Cessna Survey

Table 43

PATTERN OF CROSS-COUNTRY FLYING AT THE CHICAGO HUB — 1956 PEAK WEEKEND DAY



AVIATION SURVEY

(Continued from page 34)

factors would tend to break the actual flight distance frequency down to figures comparable with those obtained during the two-day survey.

Directional analysis of cross-country flights to and from the Chicago hub. An analysis of the aircraft entering and leaving the Chicago hub during a typical weekend peak is presented in Table 43. A tabulation of aircraft by type and distance of flight for arrivals and departures is shown in Table 44.

Table 45 illustrates that a large portion of the cross-country flights into the Chicago hub originated in localities other than hubs. It is apparent that, in the Chicago hub area in any event, the many origins and destinations of the cross-country flights present a more or less random pattern around the compass. This pattern, of course, varies for each hub and individual analyses must be made for each section. The presentation here is indicative of an analysis which can prove useful in developing airspace usage requirements around a major hub area by cross-country flying. A total analysis of all hub areas covered during the course of the two-day survey has not been carried out because of the great time requirements. The data are available, however, and further developments of similar patterns can be made as necessary.

Table 44

DIRECTION OF CROSS-COUNTRY FLIGHTS ON A DAY AT THE CHICAGO HUB

Estimated Number of Flights on a Peak Day of a Typical Busy Week

Octant	Miles	Aircraft Class I	II	III	IV	Total
NNE	Under 100	0	0	0	0	0
	100-200	0	0	2	0	2
	Over 200	2	0	0	0	2
ENE	Under 100	9	0	20	8	37
	100-200	5	0	22	2	29
	Over 200	13	11	14	3	41
ESE	Under 100	63	21	130	53	267
	100-200	0	0	0	7	7
	Over 200	10	0	14	2	26
SSE	Under 100	0	0	23	25	48
	100-200	10	11	34	10	65
	Over 200	0	0	3	2	5
SSW	Under 100	0	0	43	23	66
	100-200	2	3	55	32	92
	Over 200	8	2	33	7	50
WSW	Under 100	0	0	23	4	27
	100-200	2	0	17	18	37
	Over 200	6	0	23	2	31
WNW	Under 100	3	0	68	49	120
	100-200	2	0	19	18	39
	Over 200	2	0	21	2	25
NNW	Under 100	0	0	26	29	55
	100-200	0	0	18	10	28
	Over 200	0	0	9	0	9

Source: Aircraft Operations Survey.

Effect of Weather on General Aviation Flying

An excellent example of the drop in general aviation activities with unfavorable weather is provided by the case of the Philadelphia hub during the two-day operations survey. Whereas Chicago enjoyed almost perfect flying weather for the entire 48 hours, Philadelphia was closed down most of the period.

Activity in Philadelphia was about 10% of that to be expected under completely favorable weather conditions. Philadelphia weather during the two-day survey was mixed. Various combinations of wind, cloudiness and rain severely restricted general aviation operations. Temperatures averaged about 50 degrees throughout the survey period. Philadelphia was extremely windy with intermittent cloud coverage and slight precipitation. On Satur-

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Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Dixie Air Associates, Inc.
Municipal Airport
Memphis, Tennessee

Executive Aircraft Company
Municipal Airport
Kansas City, Missouri

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

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Civic Memorial Airport
East Alton, Illinois

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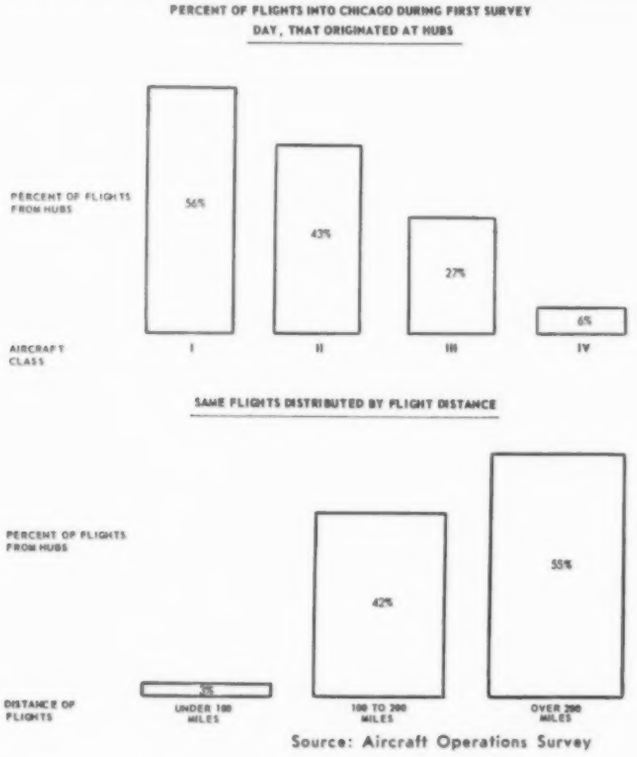
Table 45

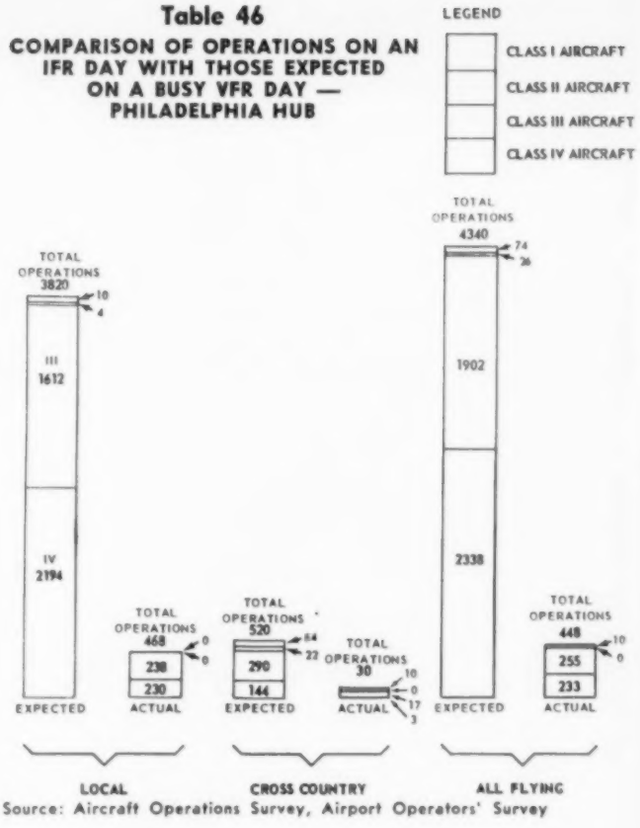
ORIGIN OF CROSS-COUNTRY FLIGHTS INTO CHICAGO HUB



Source: Aircraft Operations Survey

Table 46

COMPARISON OF OPERATIONS ON AN IFR DAY WITH THOSE EXPECTED ON A BUSY VFR DAY — PHILADELPHIA HUB



Source: Aircraft Operations Survey, Airport Operators' Survey

day, winds decreased but scattered showers and heavy cloud concentrations occurred.

Field reports from the airport manager in the area verified the restricted aviation picture as reported above. Friday and Saturday each were reported to have had IFR conditions prevailing approximately 75% of the daylight hours.

A comparison of flight operations in Philadelphia on the Friday and Saturday of the survey with what would have been expected had good VFR weather obtained is presented in Table 46. The estimated VFR operation expectancy is based upon extensions of correlated figures from other major hub areas for good VFR weather during the survey.

The impact of all classes of aircraft is apparent, with Classes III and IV suffering particularly. It should be noted that the local operations actually recorded were not necessarily IFR in nature but almost entirely short VFR flights during brief openings in the weather.

Although no other major hubs experienced such consistently unfavorable weather as Philadelphia, partially unfavorable conditions did obtain in other hub areas, causing a drop in general aviation activity consistent in pattern with the Philadelphia drop.

IFR activity was primarily Class I aircraft. As noted before, almost all of the local operations in Philadelphia were short VFR hops during openings in the weather. The cross-country operations show the incidence of IFR operation more clearly. Table 47 shows

Table 47

CROSS-COUNTRY FLYING DURING SURVEY PHILADELPHIA HUB

Aircraft Class	Flight Operations during 2-Day Survey IFR Flights	VFR Flights	Total
I	29	10	39
II	0	3	3
III	3	29	32
IV	0	2	2
	32	44	76

Source: Aircraft Operations Survey.

the actual number of IFR and VFR cross-country flights by aircraft class. It is evident that the big planes were doing the flying during these two days and that IFR cross-country flights were almost entirely by Class I aircraft. Inspection of the data concerning VFR flights indicates that these were predominately short flights again made opportunely as breaks in the weather occurred.

Although the sample is so small as to be statistically invalid, it is interesting to note that the distribution of cross-counry flights by distance either under IFR or VFR conditions showed no marked variation from the flight distance distribution to be expected on a good VFR day.

In summary, it is evident that Class I aircraft were far more active than were the lower performance planes, although their activity was at a greatly diminished rate. There was some cross-country activity by Class III aircraft—most of it VFR—and a bit of local VFR flying "sneaked in" during weather breaks. It is furthermore interesting to note that at no time did operations during this essentially IFR period reach a peak greater than operations to be expected in early darkness hours during a good VFR day.

The present rate of IFR tower approaches by general aviation is approximately 40,000 *annually.* Civil Aeronautics Administration figures for the year 1955 give the breakdown of general aviation IFR tower approaches as shown in Table 48.

This number of instrument approaches by general aviation for 16 selected hubs is listed in Table 49.

Table 48

IFR TOWER APPROACHES - 1955

Hub Type	Number of CAA Towers	Average Number of Approaches Per Tower	Number of Approaches for Each Group of Hubs	Per Cent at Each Type of Hub
Large	31	576	17,848	44%
Medium	36	265	9,538	24
Small	59	195	11,516	28
Nonhub	15	101	1,516	4
			40,418	100%

Source: Civil Aeronautics Administration (for the year 1955).

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Table 49

IFR TOWER APPROACHES FOR SELECTED HUBS 1955

Name of Hub	Hub Size	Annual IFR Tower Approaches
New York	L	2,931
Detroit	L	2,393
Los Angeles	L	2,104
Chicago	L	1,526
Fort Wayne	S	1,445
Pittsburgh	L	1,283
Houston	L	1,240
South Bend	S	1,114
Cleveland	L	1,086
Boston	L	963
Indianapolis	M	932
Washington, D.C.	L	620
Philadelphia	L	532
Dayton	M	501
Dallas	L	384
San Francisco	L	358

Source: Civil Aeronautics Administration.

At this point it is necessary to shift to data concerning IFR flight plane departures. It can be generally assumed that the arrivals, under IFR conditions, are approximately equal to departures under IFR flight planes. However, many of the aircraft entering a hub under IFR conditions find that local weather permits a VFR "let down" which lessens the demand for IFR tower approaches and, therefore, the number of recorded instances. IFR departures on a typical peak IFR day in selected hubs are shown in Table 50.

Table 50 also estimates the hourly peak IFR departures on the extremely optimistic assumption that the hourly peak index is the same as that occurring on a VFR day. Lacking any other data to shed light on hourly peaks under IFR conditions, this assumption appears safely conservative as a basis for estimating peak IFR loads generated by general aviation today.

Table 50

IFR DEPARTURES ON A TYPICAL PEAK IFR DAY FROM SELECTED HUBS

Hub Name	Hub Size	Approximate Peak Day IFR Departure	Approximate Peak Hour IFR Departure
New York	L	55	8
Detroit	L	28	4
Los Angeles	L	10	2
Chicago	L	33	5
Fort Wayne	S	8	1
Pittsburgh	L	22	3
Houston	L	24	4
South Bend	S	9	1
Cleveland	L	14	2
Boston	L	13	2
Indianapolis	M	12	2
Washington, D. C.	L	25	4
Philadelphia	L	10	2
Dayton	M	26	4
Dallas	L	12	2
San Francisco	L	7	1

Source: Civil Aeronautics Administration (for the year 1954) Aircraft Operations Survey.

Owners' and regular pilots' statements verify this disinclination to fly IFR. The actual operations data from the Philadelphia survey and the CAA records on IFR activity are generally supported by the statements of pilots and owners concerning the operation of their own aircraft. Table 51 presents the pattern of IFR flying by these pilots as supported by their log book examinations. Again Class I and II lead the way in IFR flying, although 35% of the pilots claim that they have flown no trips during which IFR conditions prevailed at any time during the trip, while less than 1% state that they fly some portion of their trips under IFR conditions more than 15% of the time. Sixty-six per cent of the Class III pilots and 84% of Class IV state that they do not fly under IFR conditions.

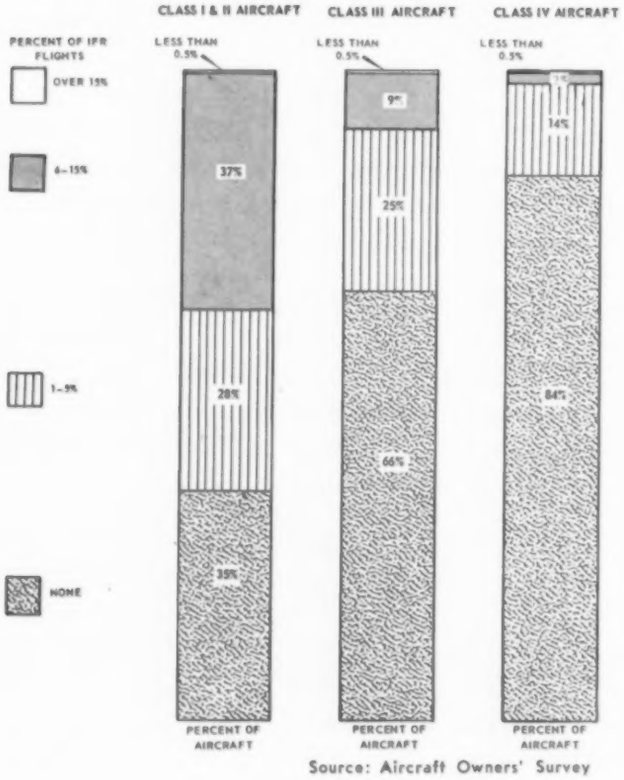
VFR flight plans are not regularly used by most general aviation pilots. The great majority of general aviation pilots do not cover their flights by filing VFR flight plans. Table 52 shows the distribution of VFR flights covered by flight plans as reported by aircraft owners and regular pilots. Again the Class I and II aircraft show a greater tendency to cover their operations by flight plans, thus furthering the impression that pilots of these aircraft avail themselves most fully of aviation facilities. Class III aircraft pilots show somewhat less of inclination to file VFR flight plans and Class IV pilots apparently prefer to go their way without submitting flight plans for their trips.

Most of general aviation aircraft use airways facilities when available. As a general proposition, the pilots of general aviation aircraft use airways facilities on cross-country flights when

(Continued on page 56)

Table 51

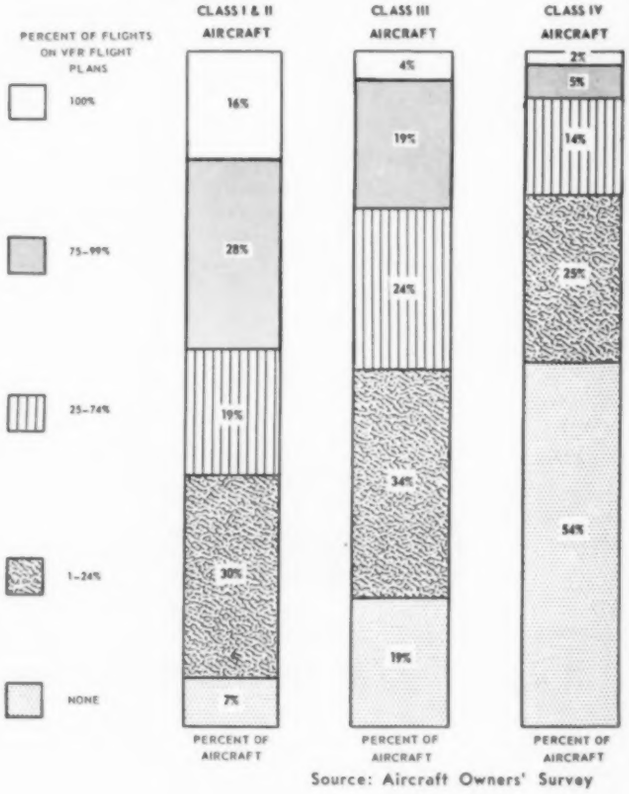
FREQUENCY OF FLIGHTS SOME PORTIONS OF WHICH ARE FLOWN UNDER IFR CONDITIONS



Source: Aircraft Owners' Survey

Table 52

VFR FLIGHT PLAN COVERAGE



Source: Aircraft Owners' Survey

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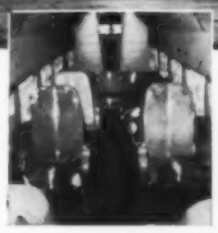
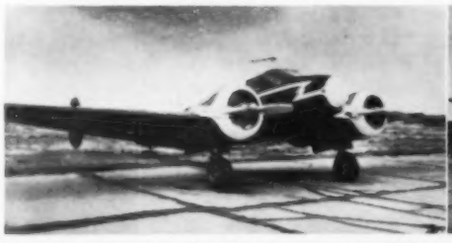


LOCKHEED LODESTAR

Serial Number 2324, Registration Number N70026, manufactured 1943, Flush riveted, total aircraft time 2,816 hours. **INTERIOR:** Accommodates 11 passengers and 2 pilots. It is finished in Western style with brown leather and light brown cloth headliner; seats are in natural leather (unborn calf skin); window drapes are in cloth to match seats. Main cabin contains a long curved divan, five large reclining chairs, three recessing card tables, a coat compartment, a Barber-Coleman heater with thermostat and storage compartments. Lavatory is finished in leather and contains a wash basin, a toilet container, a large mirror and storage compartment. Galley is finished in leather and contains one passenger seat, triple thermos, large ice box, electrical outlet and multiple storage compartments. **EXTERIOR:** Painted tan with brown trim and white top. **ENGINES:** Wright 1820-56, completely modified and have 741 hours each since major overhaul. **RADIO:** Includes ARC Omni, ILS, dual Bendix ADF, Marker Beacon, ARC 3 Transmitter-Receiver and ARC 5 Transmitter-Receiver. **OTHER EQUIPMENT:** Includes Sperry A3 Autopilot, Grimes Rotating Beacon, 178 gallon Auxiliary and Fuel tank (No. 4 baggage bin). **PRICE:** $120,000.00 net f. o. b. Dallas, Texas.

BEECH D18S



Serial Number A261, Registration Number N80351, total aircraft time 4,884 hours. **INTERIOR:** Accommodates 6 passengers and 2 pilots. Main cabin is finished in grey with curtains to match and contains reclining chairs, a divan, a drop leaf card table, a coat hanger rack, dual thermos and storage compartments. Lavatory includes a toilet container, baggage space and aluminum cabin loading steps. **EXTERIOR:** Painted in very attractive dark green with white trim and white top. **PROPELLERS:** Hamilton Standard Hydromatics. **ENGINES:** Pratt & Whitney R985-14B with 669 hours each since major overhaul. **RADIO:** Dual ARC Type 17 Omni, ILS, 3 light Marker Beacon, ARC 3 Twenty Channel Transceiver, Bendix ADF, ARC T-11 VHF Transmitter, ARC VHF tunable receiver. **OTHER EQUIPMENT:** Includes an 80 gallon auxiliary tank (nose compartment), Grimes Rotating Beacon, windshield wipers and propeller anti-icing. **PRICE:** $37,500.00 net f. o. b. Dallas, Texas.

BEECH B-50 TWIN BONANZA

Serial Number CH-46, Registration Number N-3586B. Total aircraft time since new 737 hours. **INTERIOR:** Blue and grey with white leather seat trim; accommodates 5 passengers and 1 pilot. **EXTERIOR:** Painted blue with white trim and white top. **ENGINES:** Lycoming GO 435-C2 with 737 hours since new. **PROPELLERS:** Beech two blade full feathering. **RADIO:** Lear LVTR 36 channel Transceiver, ARC 15D Omni, ILS, 3 light Lear 2200 Marker Beacon, Lear 14B ADF, ARC T-11 VHF Transmitter and Lear L-F Receiver. **OTHER EQUIPMENT:** Includes Janitrol heater, Grimes Rotating Beacon, Nose Taxi light and Moonglo instrument light. **NEW COST:** $88,500.00. **PRICE:** $49,500.00 net f. o. b. Dallas, Texas.

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—(AiResearch Photos.)

NATIONWIDE ROUNDUP:

New Business In the Hangar

DALLAS AERO SERVICE is completing CAA type certification of Jato for the D18S Twin Beech, using a single Aerojet rocket engine of 1,000 lbs. thrust and 15-sec. duration. No weight penalty is involved, adjustment for gross weight off-setting the rocket installation. Its purpose is for emergency standby auxiliary thrust in event of one-engine-out emergencies. On take-off, for example, with one engine feathered at 95 mph. and the rocket fired at that point, the single rocket will give the Twin Beech sufficient additional single-engine rate of climb to attain in excess of 250 ft. of altitude above the runway and 110 mph., which is best single-engine climb speed — all within 15 seconds. Ben Cumnock of DAS said the firm also plans to begin work certifying the Dove for the rocket and also certifying single-engine workplanes, such as 2-place and 4-place pipe line patrol craft, which are usually flown only about 100 ft. off the ground. They will use a junior rocket of 250 lbs. thrust, sufficient to give them about 400 ft. of altitude in event of engine failure at 100 ft. or so. Gross weight adjustment to off-set the added weight is expected. . . . Other interesting happenings at DAS last month included: Jim Cook, the U. S. Weather Bureau's tornado research pilot, has added a Lockheed P-38 to his stable and DAS will equip it with special radio, electronic, radar and recording installations. . . . The Custer Channel Wing twin was in for modifications extending its two half-barrel airfoils rearward for additional propeller thrust. . . . A Federal autopilot was installed in El Paso Natural Gas's D-50 Twin-Bonanza for Swede Johnson. . . . Tony Zuma's Tennessee Gas and Transmission DC-3 from Houston is getting wheel-well doors.

AERO CORP. OF ATLANTA has a new Army contract to overhaul 277 Franklin Aircooled engines for helicopters. . . . A Guatemala government DC-3 remanufacturing job has been completed. . . . The avionics department is now working on a classified manufacturing project for missile electronics.

AIRESEARCH AVIATION SERVICE DIVISION of the Garrett Corp., Los Angeles International Airport, has extensively reworked Jim Ketner's Texas Eastern DC-3 — the project included 8,000-hr. overhaul, picture windows and complete new interior, RCA AVQ-10 radar, Maximizer ex-

WORLD'S MOST COMPLETELY-RADIO-EQUIPPED EXECUTIVE DC-3 has installation by Associated Radio of Dallas in center-section bays with all fuel in outboard tanks. One of four air-cooled bays is shown. They eliminate cabin radio racks. Console shown is behind pilot, has Sperry analyzer, RCA radar scope, auxiliary Collins course-line indicator and autopilot controls, and circuit-breaker panel. Collins Radio contracted for Associated to do the engineering for CAA licensing of its AP-101 autopilot installation, this being the prototype DC-3 installation. DC-3 is owned by Delhi-Taylor Oil, Dallas. Aircraft Technical Service, Van Nuys, engineered the center-section modification.

—(Associated Radio Photos.)

The '57 Beechcraft Twin-Bonanza offers more payload, carries more cargo, has greater range, gives better performance, has more visibility, more passenger comfort, is more quiet, has more safety features, a better safety record, comes more completely equipped, has higher resale value than any other airplane in its class!

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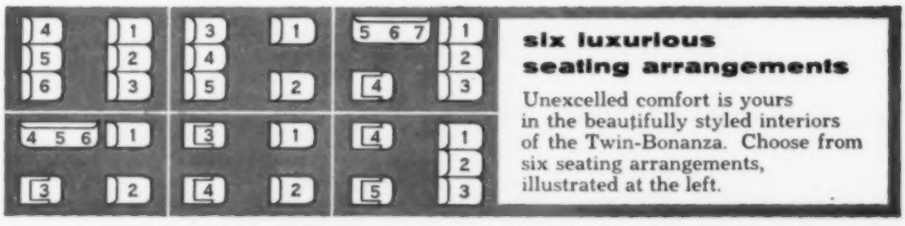
For a demonstration ride and operating facts about the Twin-Bonanza, and the finest financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas.



six luxurious seating arrangements

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Beechcraft

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(FLIGHT MAGAZINE Photos.)

SMALLEST AND LIGHTEST RADAR FOR LIGHT TWINS, the new 50-lb. RCA AVQ-50, is pictured above in a Twin Beech demonstrated by John Whitehead of RCA at 11 cities last month with both the new 3-in. and the 5-in. panel scopes. Carl Fox, Associated Radio, Dallas, is shown at right adjusting 3-in. scope controls. It has 11-in. dish antenna.

UPSTAIRS PILOTS' LOUNGE WITH A VIEW has been opened by Ragsdale Flying Service at Austin, Texas. Bobby Ragsdale, whose Cessna operation features complete sales and service, designed the air-conditioned observation lounge.

haust system and wheel-well doors, electrical, radio and radar modifications, new panels and exterior painting. John Hardy accompanied Ketner on the job. . . . A National Supply Martin 404, Chuck Hanner, chief pilot, has received an RCA AVQ-10 radar, 1,000-hr. inspection and engine change. . . . U. S. Industries' Convair 440 is receiving extra fuel capacity for a 2,080-gal. total, complete custom interior, auxiliary power unit, radio modification and exterior paint. . . . Tracy Service's Libby-Owens-Ford DC-3 is getting Maximizer equipment. . . . Mohawk Airlines Rep. Ken Atwel has taken delivery of the fourth Convair 240 to have its seating increased from 40 to 46 and a front integral stairway.

L. V. EMERY'S EXECUTIVE AIRCRAFT SERVICE, Garland Airport, Dallas, has completed Russ Purchase's Dow Chemical DC-3 from Midland, Mich., the project including Collins AP-101 autopilot, Bendix radar, ARC ADF, new interior, airframe overhaul, Pan Am wheel-well doors, Aircraft Conversion's wing fillet fairings and aileron gap covers and a new electrical system. . . . Stein Lee's Gulf Oil Lodestar from Ft. Worth was relicensed with engine change. . . . Doc Copeland's Rutherford Oil Lodestar from Houston was in for radio installation. International Petroleum's B-23 returned to Lima, Peru, after an 8,000-hr. overhaul.

REMMERT-WERNER, Lambert Field, St. Louis, reports Lee Snow's Off-Shore Company DC-3 was in for lightweight landing gear doors, one-shot bromide fire extinguishing system, Edison fire detector system and geared rudder tab modification. . . . Aerojet rocket engine installation and double engine change were obtained by Hank Haddock for his Falstaff

NEW AERO COMMANDER SALES HEADS announced by R. J. White, Aero Design & Engineering Co. vice president-sales director, are E. B. Charles (top left), commercial sales manager; L. R. Sackett (top right), assistant commercial sales manager; E. T. Charlton (lower left), Latin American sales manager, and J. C. Watson (lower right), service manager. All are Aero Design veterans.

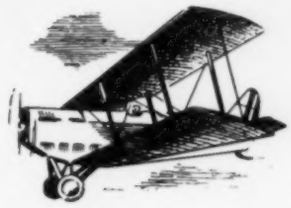
Brewing DC-3. . . . The Wolfe industries DC-3 was in for de-icer boots and exchange of control surfaces. . . . Engine changes were for Charles Russell's Sears Roebuck D18, Bob Burke's Lauhoff Grain D18, Chuck Morrow's Milner Enterprises Lodestar, Ralph Whitworth's Coca Cola DC-3 and Vern Fink's Sun Oil Super DC-3. . . . National Breweries' DC-3, John Trotter, chief pilot, was at Remmert-Werner's Pompano Beach base for 8,000-hr. overhaul with center-section modification, Bendix radar with R-W hinged radome and swing-away antenna mount, engine change, heating system modification, new paint and new interior.

NEW ROYAL GULL SALES EXECUTIVES are A. F. Balaban (left), merchandising and advertising manager, and N. Blair Core (right), assistant to the executive vice president, as announced by Carl Wootten, executive vice president of Trecker Aircraft Corp., Milwaukee, in charge of Royal Gull sales.

HORTON & HORTON CUSTOM WORKS at Ft. Worth was represented by several award-winning entries in the Reading Aviation Service contest. One winner was George Young's Fairways Convair 440 of Washington, D. C., and with his H & H interior worldwide charter customers get dinnerware, table silver, Irish linen tablecloths, foam rubber mattresses and gold-striped sheets and pillow cases. . . . Mrs. Patrick Frawley (Papermate Pen) sent her Aero Commander in for a Gold Crest interior with imported blue linen headlining, powder blue genuine leather, and beige and blue tweed seats. The California-based Commander is flown by Jim Badgett. . . . Turquoise and sand beige with iridescent leather are featured in a custom interior for the Ray Industries Aero Commander from Detroit. . . . Downtown Airpark's new Commander demonstrator from Oklahoma City was in for a red-and-black Gold Crest interior featuring a full-length red translucent plexiglas overhead lighting panel for the cabin. . . . Recent drop-ins at H & H included Aero Commanders from Magnolia Petroleum, Dallas; Bill McDavid Oldsmobile, Houston (Formica-covered thermos); Hunter Aviation, St. Louis; Trans-Aire, New Orleans; Ft. Worth Pipe & Supply; J. P. Mendez and Banco de Mexico, Mexico City; Mene Grande Oil, Venezuela (super Sky-Hampers and Skytables). . . . J. Ray McDermott, New Orleans, took delivery of his second green nylon H & H Widgeon custom interior. . . . A hand-embroidered Cuban flag, on white Peruvian linen seat headrest, was a final H & H touch for the interior in a new Bell J executive helicopter for the Cuban government.

SPERRY INTEGRATED INSTRUMENT SYSTEMS are being installed in more and more business aircraft engaged in all-weather flying. The system includes the C-6 Gyrosyn compass, HZ horizon flight indicator (which combines the cross bars of the Zero Reader flight director with 2-color sphere-type remote attitude indicator), and the R-1 pictorial deviation indicator (which replaces the omni bearing selector, ILS deviation indicator and the to-from indicator). Business aircraft owners have purchased over $300,000 worth of the Sperry integrated instrument systems.

HOWARD AERO, San Antonio, reports its 22nd Super Ventura is going to Cluett Peabody, New York City, and will have Sperry A-12 autopilot, Collins communication and navigation equipment, Bendix ADF, Sperry C-4 compass system, Bendix radar, Narco DME, Transvaal HF radio and P & W R-2800 AM-10 engines. . . . Minnesota Airmotive at Wold Chamberlain Field, Minneapolis, has contracted for Howard Aero rudder and elevator spring tabs for their 4b Super Lodestars. . . . ROBERT E. (BOB) WOLIN has been named general sales manager of Howard



R. W. (Shorty) SCHROEDER

Rudolph William Schroeder, holder of Commercial Pilot certicate No. 7, first learned to fly in Chicago in 1910. Serving in the army air corps in 1917 and 1918, he was promoted to the rank of major, and became chief test pilot. He has many daring firsts to his credit. On February 27, 1920, at Dayton, Ohio, he made the first altitude flight to reach over 30,000 feet.

By 1920 the aviation industry was growing rapidly. Because of the courage and daring of such men as Schroeder, new innovations were continually tested and progress was assured.

Testing was costly, however, so progress was also dependent on sound finances. This came to the industry in 1928 in the form of "aviation insurance", when a small group of men with vision and foresight, and faith in the future of aviation, organized the United States Aircraft Insurance Group.

This same "U.S. Group", now grown to over 60 leading companies with multi-billion dollar assets, continues to serve the aviation market as it has for the last quarter century.

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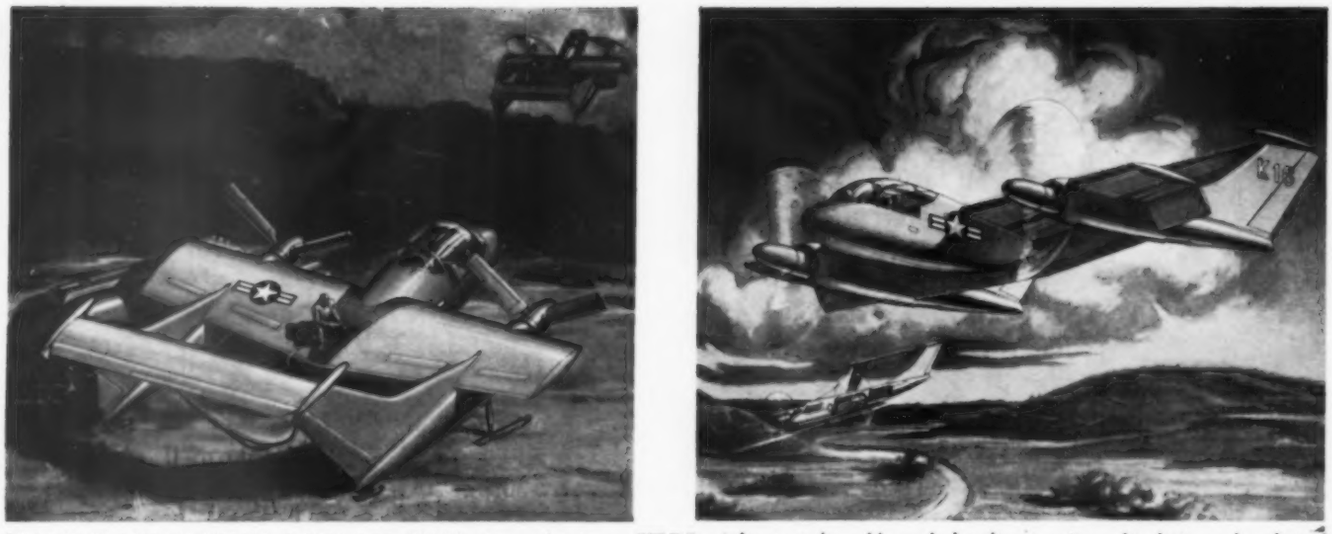

SPEED RANGE FROM 0 TO 300 MPH. is goal of an STOL (short take-off and landing) aircraft being developed for the Navy by Kaman Aircraft. As seen in sketch at left, propulsive rotors have small controllable flaps on trailing edges. These are said to give the pilot positive control at 0 to 50-mph. speeds. In sketch at right, note large Fowler flaps. Engines will be gas turbines. —(Kaman Aircraft Sketches.)

Aero's manufacturing and service divisions. Eighteen years in aviation, Wolin formerly was with the CAA in Cleveland and came to Howard from Lear, for which he was Midwest and Southwest district manager. Howard has also named ROBERT L. (BOB) ROBERTSON staff assistant in charge of all production planning and establishment of flat rates for all aircraft work. He had long experience with Braniff Airways, becoming superintendent of aircraft overhaul in 1952, and came to Howard from Dallas Aero Service.

AERODEX, INC., Miami International Airport, is adding 44,000 sq. ft. of shop area at a cost of $500,000 to its aircraft engine and accessory overhaul facility's existing 222,000 sq. ft. Raymond M. Tonks, president, said increased business and future demands made the addition necessary " and we expect to add another 1,000 employes in the next 12 months." He already employs 1,300 persons, turns out 17 engines a day for the Air Force alone and has parts modification and accessory overhaul contracts with the Air Force, Navy, Coast Guard and foreign governments. A separate Aerodex operation overhauls engines and accessories for business aircraft owners and 14 domestic and foreign airlines.

SOUTHWEST AIRMOTIVE, Love Field, Dallas, has Tom Smith's Shamrock Oil and Gas D18S for major work including installation of Airline

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Every aviation service, whether it be at the engine overhaul facilities of Dallas Airmotive in Dallas or at the Company's complete fixed base operation at its Island Service Division in Galveston, is performed with the precision of a watchmaker.

These services are many and varied. Dallas Airmotive continues to be the nation's leader in the overhaul of airplane engines at its extensive Dallas plant.

At Galveston, practically every other service for the airplane operator is available. The Island Service Division performs all types of modification, painting, radio-electronics — navigation sales and installation, overhaul for conventional planes and helicopters, and accessory sales, service and installation.

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Training's Safety Performance kit. . . . Finishing touches were applied to a new interior for Mustang Aviation's D18S, for which Paula Womack selected the fabrics and colors. . . . Other projects have included engine changes and jobs for Lockheed-Georgia's Lodestar, Les Hewitt and Hank Price, pilots, and Mac McLain, mechanic; H. L. Brown's Super 18, Hank Mares, pilot; Codell Manufacturing's Aero Commander, E. F. Kinnaird, Jr., pilot, and La Consolidada's B-50 Twin-Bonanza, Louis Salinas, pilot.

PACIFIC AIRMOTIVE, Burbank, has a 5-year contract covering leasing of 24 R-2800-CB engines for Slick Airways DC-6's, the million dollars' worth of engines to be supplied by PAC's Pioneer Aircraft Leasing subsidiary and overhauled periodically by PAC's engine shop. Roy Backman, PAC vice president, and Henry P. Huff, Slick vice president-operations-maintenance, negotiated the deal. . . . Six Lockheed Lodestars were in for PAC modification and overhaul — from Westinghouse, Forest Oil, Sunray Mid-Continent, Pacific Northwest Pipe Line, Westinghouse Air Brake and Sangamo Electric. Also in were Union Oil's Convair 340 (speed and sound conversion, cabin floor modification and interior furnishings) and 3 Doves, a PBY, a DC-3 and a Beech Twin for drop-in service. . . . HARRY GREENWALD, senior employe among officers of the company and treasurer, has been elected vice president-finance of PAC. During his 12 years with the firm, PAC's annual sales volume has soared from $4,606,000 in 1945 to $21,254,921 in 1956.

David Dows, Jr., of AIRWORK, LTD., announced his firm and its branches have received the first aviation distributorship awarded by Delco-Remy.

THE CUSTOMER IS KING

(Continued from page 27)

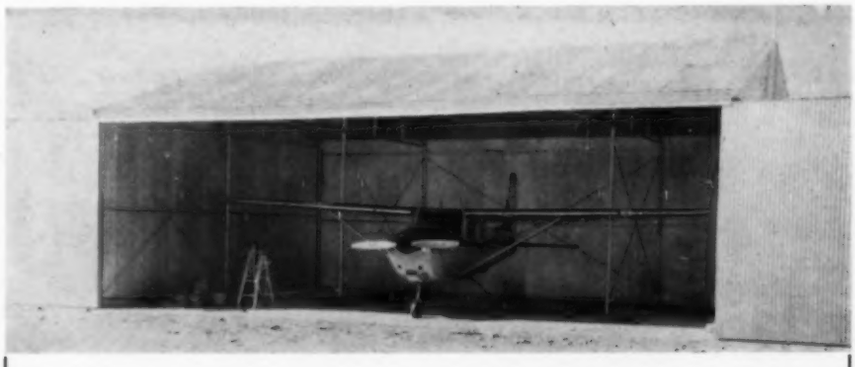
Aero Commanders dominated the class of twins between 5,000 and 12,500 lbs. and the 680 Commander of James T. Harrison of Wichita Falls, Texas, and Ft. Lauderdale, Florida, was best of class and had best equipment and best interior. Its pilot, Bill Brand, gave credit to E. Farnell Co., Palm Beach County Airport, Lantana, Florida, for its equipment; to Horton & Horton of Ft. Worth for its Gold Crest interior with hand-woven fabrics; to Downtown Airpark, Oklahoma City, for its paint job, and to Dallas Aero Service for Bendix flow meters and dual hydraulic system. Equipment includes Wilcox glideslope, ADF and marker beacon, ARC dual omni, ARC CD-1 course director, Narco 1016 communications, ARC T-11 standby, complete Lear L-2 autopilot system, and custom instrument panel with electric system on pilot's side and vacuum system on co-pilot's side.

The Lukens Steel 680 Commander, best exterior, was described by Pilot W. F. Austin as having a factory paint job designed by his firm's art department and featuring two tones of blue with a red stripe. This Commander features special Reading Aviation Service antenna installations including VHF navigation antenna flush-mounted in the fin, Collins glideslope antenna base flush-mounted in the nose with only the bull ring exposed, and streamlining of ADF sense antennas with rear ends attached to a spread bar through the fin only about 12 inches above the roof.

EXECUTIVE HANGAR, 160 by 160 ft. with 30-ft. clearance, is being erected at Addison Airport, Dallas. Shown are Don Beeler, Delhi-Taylor Oil, and Charles Bolton, Union Chemical, chief pilots whose fleets will occupy it. A similar hangar is going up for Collins Radio at Addison.

Ed Chadderton of Sharon, Pennsylvania, dominated the Cessna 310 category. He gave credit to Southern Airways at Broward Field, Ft. Lauderdale, Florida, from whom the 310 was purchased, and to General Aviation at Willoughby, Ohio, for equipment installation and painting. The 310 has a two-tone gray silk and white leather interior. Chadderton also scored high in the single-engine awards with a new Cessna 182, completely equipped at a total new cost of $37,000. Chadderton gave additional credit to Reading Aviation, L. B. Smith at Miami and L. B. Smith at Harrisburg, which have done work on the two ships. Chadderton owns the Sharon airport and has nine airplanes.

The Radio Corporation of America Cessna 310 won best exterior, and Project Pilot Frank Pearson of Wilmington, Delaware, gave credit to Fritz Bachman of Kutztown (Pennsylvania) Aviation Service for its paint job of two years ago and to RCA Flight Lab mechanics for their pride in keeping the exterior in prize-winning condition.—G. E. H.



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HARTZELL

CESSNA 310B

(Continued from page 23)

Three rear seat belts are standard. The utility baggage shelf has been redesigned to allow individual rear seats to recline four inches farther and the forward edge of the shelf has a two-inch ledge to keep objects from sliding off. The headliner in the aft section of the shelf has been raised.

Front-seat construction has been improved for greater comfort.

The cabin ventilating and heating system has been changed, with the airflow reversed from rear to front and with larger air ducts. A new 35,000-BTU Stewart-Warner heater replaces the 20,000-BTU unit formerly used. Baggage area has been increased to 19 cu. ft. by recessing the rear wall five inches.

Up front, the mixture control quadrant now has index markings and multi-adjustment notches to make cruise control easier and more accurate. The instrument panel is completely new, with all navigation and communication equipment at the center and instruments and switches are relocated for greater instrument-flying efficiency. Windshield glare is eliminated by a new instrument panel shield. Four-zone, rheostat-controlled post lighting provides red lights on the panel and a new and larger overhead console furnishes secondary red and white flood-lighting. This console also houses a new 5-outlet oxygen manifold. An optional oxygen package includes an external filler valve, eliminating cylinder removal from the airplane.

Other changes include new and quick-removable "Pachmayar" fasteners which replace Phillips screws on the upper engine cowl and nose cap assemblies. A 100-watt taxi light replaces the 50-watt unit formerly used. A smaller Grimes rotating beacon is

View through outside baggage door shows spacious luggage compartment of Cessna 310B.
—(Cessna Photo.)

used. A fuel filter by-pass has been added, auxiliary fuel gauges are located on the instrument panel and the microphone is located between the two front seats.

The Lear ADF-12E and ARC ADF-21 are optional equipment. A new, smaller safe-flight speed indicator is offered as a deck-mounted unit.

BEECH TRAVEL AIR

(Continued from page 21)

about midway between the Piper Apache and the Cessna 310, and this was taken to indicate a price of about $45,000. However, the latest Twin Cessna version, the 310B, made its appearance this month at a price $5,000 higher than the preceding model at $59,950, and the Travel Air price might prove to be somewhere between $45,000 and $50,000. It appears at this writing that about 40 will be delivered to distributors this year with a planned rate of production at one per day in 1958.

TRAVEL AIR EQUIPMENT

(Continued from page 21)

cigarette lighter, openable storm window for pilot, openable rear windows, coat hangar rod, map pockets, arm rests, reclining 3-position (fore and aft) front seat with two removable headrests, easily removable reclining 2-position rear seat with provision for use or stowing front-seat headrests, Beech shoulder harness. EXTERIOR FINISH: Complete enamel paint job. OPTIONAL EQUIPMENT: To be announced.

BAYOU BABY

(Continued from page 29)

edge of the front seat to the instrument panel. There is no baggage compartment as such—the third seat and its legroom are it when just two persons fly. Capacity for baggage, in that case, is 200 lbs.

The cabin, sitting out in front of the wing as it does, offers unlimited visibility. The doors, both hinged at the center of the cabin, are also the windshield and windows — all glass. During our flying with Gilley, we never did latch them. It was hot in the marshes and we just let them ride free without fastening them. They neither bounced nor vibrated.

There is practically no vibration in the cabin, with the engine behind and overhead on a pylon instead of being out front where it could shake the whole cabin. The instrument panel, which is simplicity itself and which Gilley hasn't cluttered with a lot of fancy stuff he has no need for, doesn't vibrate at all. Engine exhaust noise, however, is considerable, being chopped by the prop.

Distance of instrument panel from seat shows Skimmer's exceptional cabin roominess. It will be made into a 4-place cabin with 180-hp. engine.

On the water, we used the nose and wing for entry. Most of the time the nose is the gangway. It has plenty of beef. Water handling, such as turns while taxiing, is facilitated by dropping one of the main gears to help. Left and right gear retract and extend differentially or together by choice. But this requires caution so as to retract the gear in use long before water take-off is attempted. The nose gear, when retracted forward into a well scooped into the nose, serves as a pneumatic bumper when docking. Gilley has had rubber-nosed bumpers installed on his wingtips and on his floats, too. The wingtips themselves are plastic and usually bounce back into shape after being compressed while gently bumping into something, as while riding at anchor.

The hull does not draw much water and the floats are short in length and beefy. The little Skimmer seems to ride

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Sleek . . . fast . . . dependable . . . the new Cessna 182s, 180s, and 172s make business flying more rewarding than ever. And hundreds of Cessna owners get *increased* utility with the Globe Gyro-Stabilizer. This precision-built automatic rudder control pilots the plane for you while flying in traffic or while checking maps and tuning radios . . . *see more* when visibility is down. Switch on the Globe—relax—take your hands and feet off the controls! Move the Trim-Turn knob . . . automatically enter and hold a stable turn.

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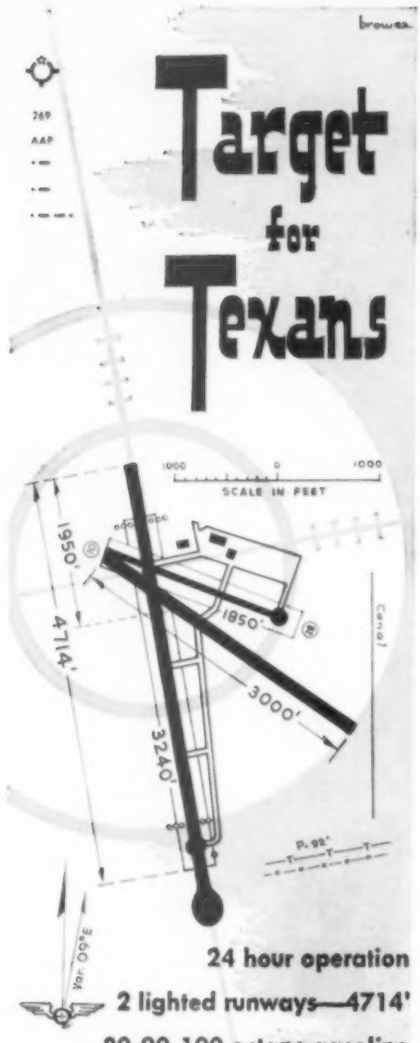

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the top of the water, rather than wallow around down in it.

Gilley obtained delivery of his airplane, which was the 7th Skimmer C-1, last November. He had flown it 135 hours when we visited him in mid-June, most of this flying being in charter work throughout the marshes. He carries oil field specialists, such as tool men, whose time is valuable in reaching the water-isolated drilling operations. "The big oil operators and contractors have larger airplanes," Gilley explained. "This makes the little Skimmer just about right for me to fill their special needs, although a 4-seater would be better. About half my trips are to take some specialist to a rig and drop him off. His rush travel ends when he arrives and he usually has time enough to return to civilization on a boat."

Gilley's Skimmer, being one of the first, has proved no exception to the rule of new airplanes developing a bug or two now and then. "But there has been nothing the factory can't remedy and I expect them to stay on top of this design to perfect it, for it is a wonderful little airplane and can fill a great need, especially in this coastal country where there is so much oil exploration," Gilley commented.

AVIATION SURVEY

(Continued from page 44)

they are available. A smaller proportion actually follows airways on cross-country flights. Table 53 shows the distribution of on and off airway flights by class of aircraft during the two-day Chicago survey. As might be expected, the use of airways goes up as flight distances become longer, and conversely, the use of airways falls off with the lower performance aircraft, which planes do most of the "random" cross-country flying to points not served by airways.

Altitude Patterns of General Aviation Flying

Ten thousand feet seems to be about the altitude limit of general aviation aircraft operations today. This limit is effectively imposed by aircraft performance and oxygen requirements. However, although a few flights are flown at this altitude and above, the great majority of flying done today by general aviation is at altitudes of 10,000 feet and under on cross-country flights.

As would be expected, a maximum altitude optimum is critically affected

Table 54

DISTRIBUTION OF CROSS-COUNTRY FLYING ALTITUDES BY FLIGHT DISTANCES

Distance Flights by Aircraft Class	CRUISING FLIGHT ALTITUDE Less than 2,000 Feet	2,001-5,000 Feet	5,001 10,000 Feet	Over 10,000 Feet	
Less than 100 Miles (Excludes flights within hub)					
I and II	7%	85%	6%	2%	100%
III	31	59	10	—	100
IV	41	54	5	—	100
100-200 Miles					
I and II	2%	69%	27%	2%	100%
III	8	71	21	—	100
IV	26	51	23	—	100
201-400 Miles					
I and II	2%	20%	78%	—	100%
III	6	41	49	4	100
IV	14	57	29	—	100
Over 400 Miles					
I and II	2%	2%	86%	10%	100%
III	7	14	76	3	100
IV	—	—	—	—	100

Source: Aircraft Operations Survey.

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by the distance of the flight. In the shorter flights, all classes of aircraft tend to hold to the lower altitudes. As trip distances increase, beyond 200 miles Class I and II aircraft move up beyond 5,000 feet to take advantage of better flying conditions and of their own performance characteristics. However, Classes III and IV still do a good bit of their flying under 5,000 feet at these distances.

This picture of cross-country flight altitudes by trip distance for all classes of aircraft is shown in Table 54.

This altitude pattern holds remarkably regardless of the geographical part of the country. Apparently pilots flying above higher ground altitudes still prefer to take the low way around obstacles. Table 55 compares the altitude by aircraft class for four different geographical regions of differing terrain, composition and altitude.

Table 55
AIRCRAFT FLIGHT ALTITUDES (ABOVE SEA LEVEL) BY GEOGRAPHICAL REGIONS

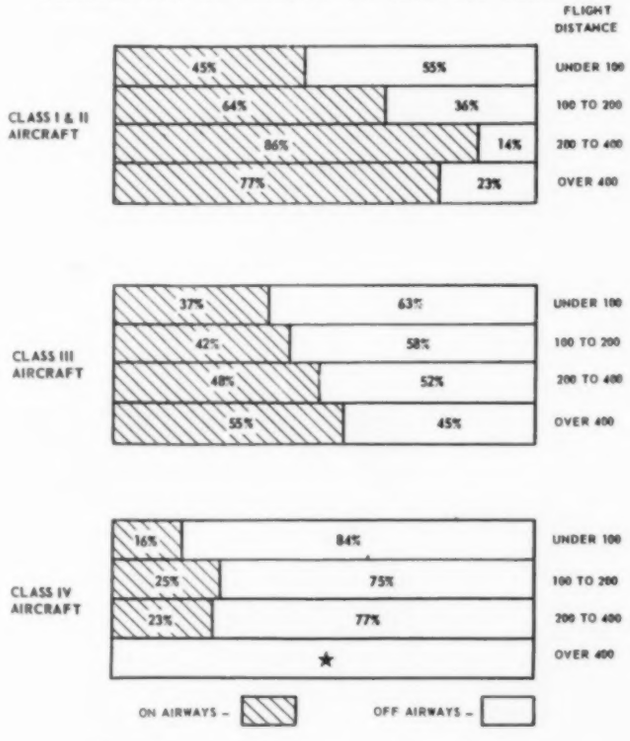
Aircraft Class	Under 2,000 Feet	2,001-5,000 Feet	5,001-10,000 Feet	Over 10,000 Feet	
WESTERN REGION					
I and II	1%	13%	71%	15%	100%
III	13	31	48	8	100
IV	13	38	43	6	100
NORTH CENTRAL REGION					
I and II	14%	39%	45%	2%	100%
III	14	51	33	2	100
IV	41	43	14	2	100
NORTHEASTERN REGION					
I and II	10%	41%	44%	5%	100%
III	12	62	22	4	100
IV	15	59	25	1	100
SOUTHERN REGION					
I and II	0%	24%	66%	10%	100%
III	14	46	37	3	100
IV	23	52	20	5	100

Source: Aircraft Owners' Survey.

The impression is given that altitude limitations on general aviation flying are not so much limitations of aircraft performance or oxygen need but rather the natural flight plan limitations imposed by relatively short flight distances and the necessity for holding to VFR rules.

This chapter (published in June and July issues of FLIGHT MAGAZINE—Editor) has presented a dynamic picture of the general aviation fleet in motion at the present time. The various features herein developed in this analysis will be used in characterizing the pattern of operations of the general aviation fleet of 1976—adjusted and extended as appropriate. (To be continued next month.)

Table 53
DISTRIBUTION OF FLIGHTS ON AND OFF AIRWAYS



★INSUFFICIENT NUMBER OF FLIGHTS TO DETERMINE PERCENTAGE

Source: Aircraft Operations Survey

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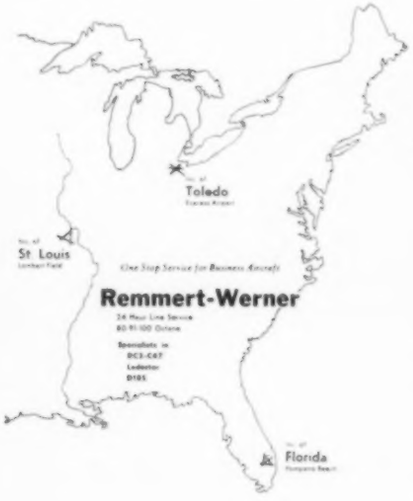

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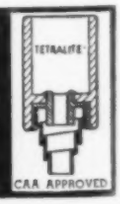

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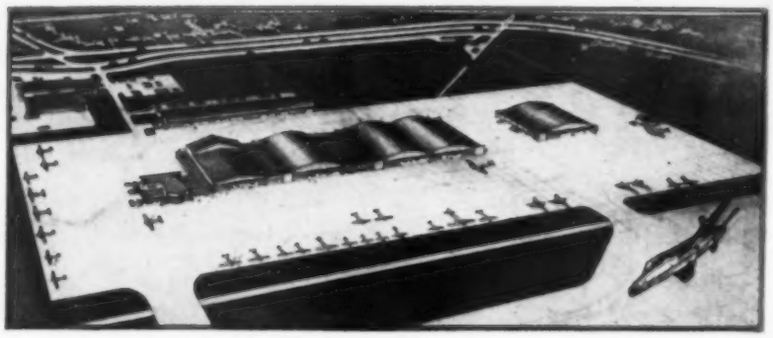

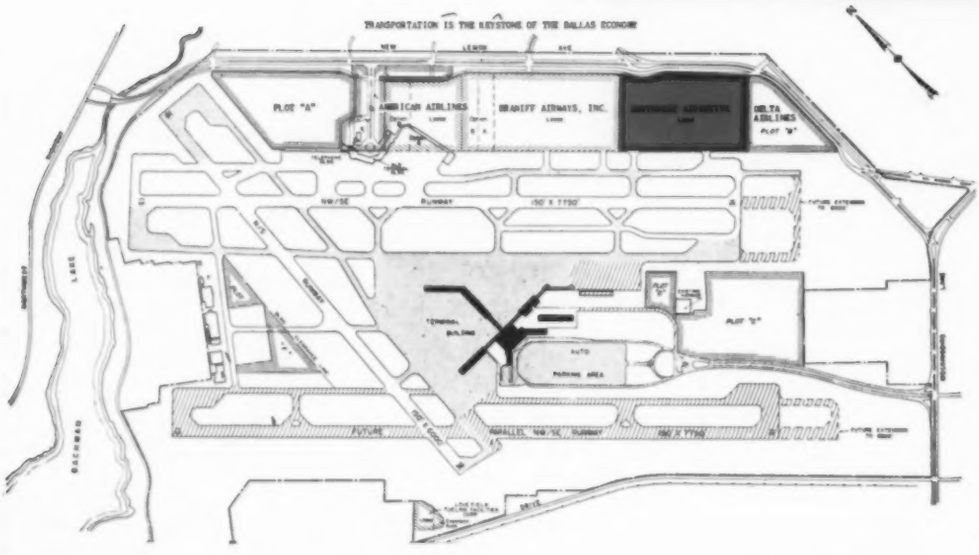

MAP shows (in red) location of Southwest Airmotive's new hangar facilities.

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